

# FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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## Flight.

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## CONTENTS

	PAGE
Editorial Comment:	
Touring by Air ...	1211
Next Year's Round Britain Race ...	1212
Men of Moment in the World of Flight: W. L. Brock ...	1213
Flying at Hendon ...	1214
D.F.W. Military Biplane (with scale drawings) ...	1216
Passenger Airships in Germany ...	1219
Royal Aero Club: Official Notices ...	1222
From the British Flying Grounds... ..	1223
British Notes of the Week ...	1225
Armchair Reflections. By The Dreamer ...	1226
Catastrophic Instability in Aeroplanes. By F. W. Lancaster, M.I.C.E. ...	1227
Foreign Aviation News ...	1230
Models. Edited by V. E. Johnson, M.A. ...	1233
Correspondence ...	1236

## EDITORIAL COMMENT.

### Touring by Air.

So much has the Naval and Military side of aviation, aided to a great extent by the sporting interest, obscured all other phases of the movement, that we are afraid the commercial and other possibilities of flying have very largely been lost to sight. It is true, moreover, that privately aviation has not made the progress in this country that we had hoped it would, once the initial difficulties had been overcome and flying had been demonstrated to be at least reasonably safe as a pursuit. Perhaps it is that as a nation we are deficient in that species of imagination which leads us to take up the thing that is new, and that we are awaiting a lead from others. Or perhaps it is that our much-hampered industry has been so intent upon securing Government orders, which have so far not materialised to the anticipated extent, that it has had neither time nor thought to spare upon the education of the casual private customer. Whatever the cause or series of causes, it is a melancholy fact that what we may call private aviation, to distinguish it from the flying done either directly for business or for the gaining of money prizes, has made very little headway hitherto. We do not care always to be contrasting what is happening in other countries with the history of development here at home.

But we should not be true to our task if we did not call attention to what is going on around us day by day—that is the function of such a journal as FLIGHT.

We have once more to turn to France for our lesson. It is significant of the progress that is being made across the Channel that we find a French daily contemporary deciding that aerial touring has now attained to such importance as to warrant a special heading being devoted to its interests and records daily. In announcing this departure, our contemporary makes the point that, although there is a great deal of flying being done by enthusiastic amateurs, it is liable to escape notice among the records made by military and other professional pilots. In order that amateur flying should really take its proper place in the records, continues our French contemporary, it has thus been decided that "tourisme aérien" shall have its own section of the journal. We would that we could justify a weekly section of FLIGHT to be devoted entirely to British aerial touring and purely amateur flying generally, but we fear that at the present rate of development it will be long ere we can make such an announcement as that with which we are dealing.

However, it is always the unexpected that happens. We go on year after year apparently apathetic to all that is going on around us, and then, oft-times quite suddenly, we appear to wake to a realisation of what things mean, and then we go ahead with rapid strides. It was so in the recent case of the motor industry. The car had been brought to a state of, we will not say even relative perfection, but certainly to a practical stage of development on the Continent by the time people in this country awakened to the knowledge that there was such a thing in existence as a really practical mechanically-propelled road vehicle. For long after that the interest was restricted to a small but enthusiastic pioneer band, who worked away at what was at once a hobby and a business. And so it went on for quite a number of years, as the history of the automobile movement is reckoned, until one day the public realised the fact that automobilism had really arrived, and that in an extremely practical form. The ultimate story of its development is written large for us to see. That development has proceeded so rapidly that for years this country has been in the position of being the largest and most valuable market for cars, save and except the United States. Once the British public grasped the full possibilities of

motoring, the growth of the movement was literally enormous, and to-day it is hardly too much to say that everybody motors. It would perhaps be taking too sanguine a view of the future to prophesy an equal popularity for aviation, but surely it is not going too far to anticipate that before long, as soon as people have begun to realise the vast possibilities of aircraft, that the amateur element will exist to at least an equal degree to that obtaining in France.

Apart from this question of "tourisme aérien," there are great potentialities in the world of commerce. These we have dealt with time and again in the pages of FLIGHT, so that it needs but a passing reference to them now. It seems a long road to travel, but we have confidence in the future of the movement in this country, once the long overdue realisation of the possibilities becomes an accomplished fact.

**Next Year's Round Britain Race.** The revised regulations for next year's competition for the *Daily Mail* £5,000 prize for a waterplane flight round Britain have just been published. So far as we are able to see they do not differ essentially from those which governed this year's event, which was so nearly won by Mr. Hawker on his Sopwith machine. The full text of these regulations will be found on another page of this issue of FLIGHT.

As under the rules relating to the 1913 competition, the event is open only to waterplanes which, in all their parts, including the motor, have been constructed within

the confines of the British Empire, though this provision does not apply to raw material. In view of the large number of entries which have been received for the War Office and Admiralty engine tests of April next, it seems safe to anticipate that the list of entries of machines equipped with British motors will far exceed the small number which last summer's competition attracted. Nor have we any doubt at all but that the *Daily Mail* will this time be called upon to hand over its cheque for the £5,000 which has been so munificently offered by Lord Northcliffe and his colleagues for the encouragement of aerial science.

As before, 72 hours will be the period allowed for the complete circuit, the Caledonian Canal being again reckoned as the sea for the purposes of the competition. Controls will be arranged, in each of which the competing machines must remain for at least an hour; for half of that time the machine to be at the disposal of the officials for purposes of examination, the remainder being available for repairs and replenishments. Stoppages between controls will be allowed, but every "landing" must be effected on the sea, an inlet of the sea, an estuary, or a harbour. Alighting on the land or on inland water will terminate the attempt. Five parts of the motor and an equal number of parts of the aeroplane will be marked, and at least two of each of these parts must be *in situ* on the arrival of the machine at each control.

Beyond these, the regulations are merely general in their incidence, and are practically identical with those which obtained in the last competition.

## W. L. BROCK. PILOT.

THE subject of our portrait this week is one of our trans-Atlantic cousins, who, like many of his compatriots, having become fascinated with aviation, decided to visit England in order to study the subject more thoroughly. Being of a scientific turn of mind, he had taken intense interest in aeronautical matters from the time when he first read of the gliding experiments of Lilienthal and Pilcher. It was in May, 1912, that he actually set sail for the Old Country, and, as he will tell you if you happen to find him in a communicative mood, his idea was to spend a few weeks in England learning to fly a monoplane and then indulge in a little sight-seeing before returning to the U.S.A.

On arrival he joined the Deperdussin school at Hendon, and taking things steadily he did not secure his "ticket" until August. By that time all his plans with regard to returning to the States had been completely upset, and he found his work here so highly interesting that there was nothing to be done but stay on

and learn still more about it. He therefore arranged in September of last year to join the Deperdussin school as a pilot-instructor, and he remained at that for nearly a year. During that period he flew every machine in the school, but his favourite 'bus was the 35 h.p. Anzani-engined Deperdussin. On this he one day made a trip to Brooklands in a gale which was sufficient to keep all the other pilots, except Gustav Hamel, from venturing aloft. On this machine he also reached 4,300 ft., and descended again in 35 mins. On the 100 h.p. Deperdussin monoplane he took a passenger up to 7,000 ft. Brock is very fond of climbing and gliding, and he says that apart from the actual pleasure he gets, so much can be learned about a machine during these manoeuvres. In addition to being thoroughly acquainted with the scientific side of aviation, Brock is a skilled mechanic, and previously to taking up flying was engaged as a designing engineer with one of the largest American motor car companies.

THE HAWK.

### Hendon to Brighton and Back.

ELEVEN entries, as follows, have been received for the race to Brighton and back, which takes place to-day, Saturday:—1. Louis Noel (70 h.p. M. Farman); 2. P. Verrier (70 h.p. M. Farman); 3. R. Carr (50 h.p. Grahame-White); 4. G. L. Temple (50 h.p. Blériot); 5. G. M. Dyott (50 h.p. Dyott); 6. W. L. Brock (70 h.p. Blériot); 7. P. Marty (50 h.p. Morane-Saulnier); 8. R. Slack (80 h.p. Morane-Saulnier); 9. F. P. Raynham (80 h.p. Avro); 10. R. Barnwell, by courtesy of Messrs. Vickers, Ltd. (120 h.p. Martinsyde); 11. G. Hamel (80 h.p. Morane-Saulnier).

The competitors will start from the Hendon Aerodrome at 11 a.m., and after passing the head of Brighton Palace Pier will land at the Shoreham Aerodrome, from where the return journey to the finishing line at Hendon will commence at 2.30 p.m., the winners being

expected to reach Hendon shortly after 3.30 p.m. After leaving Hendon the pilots will make for Harrow, and passing the Church on their left will then steer a straight course for Brighton. The turn at Harrow has been decided upon to ensure the whole of the course being over open country, otherwise competitors flying in a direct line from Hendon to Brighton would pass over the western suburbs of London. On the outward journey the racing airmen will pass near Epsom, Dorking, Reigate, Horsham, Hayward's Heath, and, after crossing over Brighton Racecourse, will fly along the sea front, passing the head of Brighton Palace Pier, the finishing point of the first stage of the race, and landing at Shoreham Aerodrome. The return journey from Shoreham will be made over the same route.

The total distance is about 130 miles, and the prizes, value £250, include the Sussex Motor Yacht Club Trophy and the Barclay Walker Trophy.



NOVEMBER 8, 1913.

FLIGHT

## MEN OF MOMENT IN THE WORLD OF FLIGHT.



MR. W. L. BROCK,

## FLYING AT HENDON.

THURSDAY of last week was very gusty, the wind jumping about from five to thirty m.p.h., which rendered it impossible to hold the biplane race arranged for that day. Marcus D. Manton was the first up on the 50 h.p. G.-W. 'bus, and he got well buffeted, but stuck to it for several circuits, climbing to about 1,500 ft., and making a spiral descent in spite of the wind. Noel was the next up on the G.-W. Maurice Farman, and he got it as badly as Manton. N. Spratt came out and tested a Breguet, which appeared to have a tendency to list to port somewhat. Later Manton, Noel, W. L. Brock (Blériot), G. L. Temple (Blériot), R. H. Carr (G.-W. 'bus) and Philippe Marty (Morane-Saulnier) all went up together, which was quite exciting, as they were all blown about a bit. Brock then went on the Blériot with Manton as passenger, reaching an altitude of about 3,000 ft., descending with a seven-turn spiral. After this the rain gave a demonstration and so wound up the proceedings.

### November Meeting, Saturday.

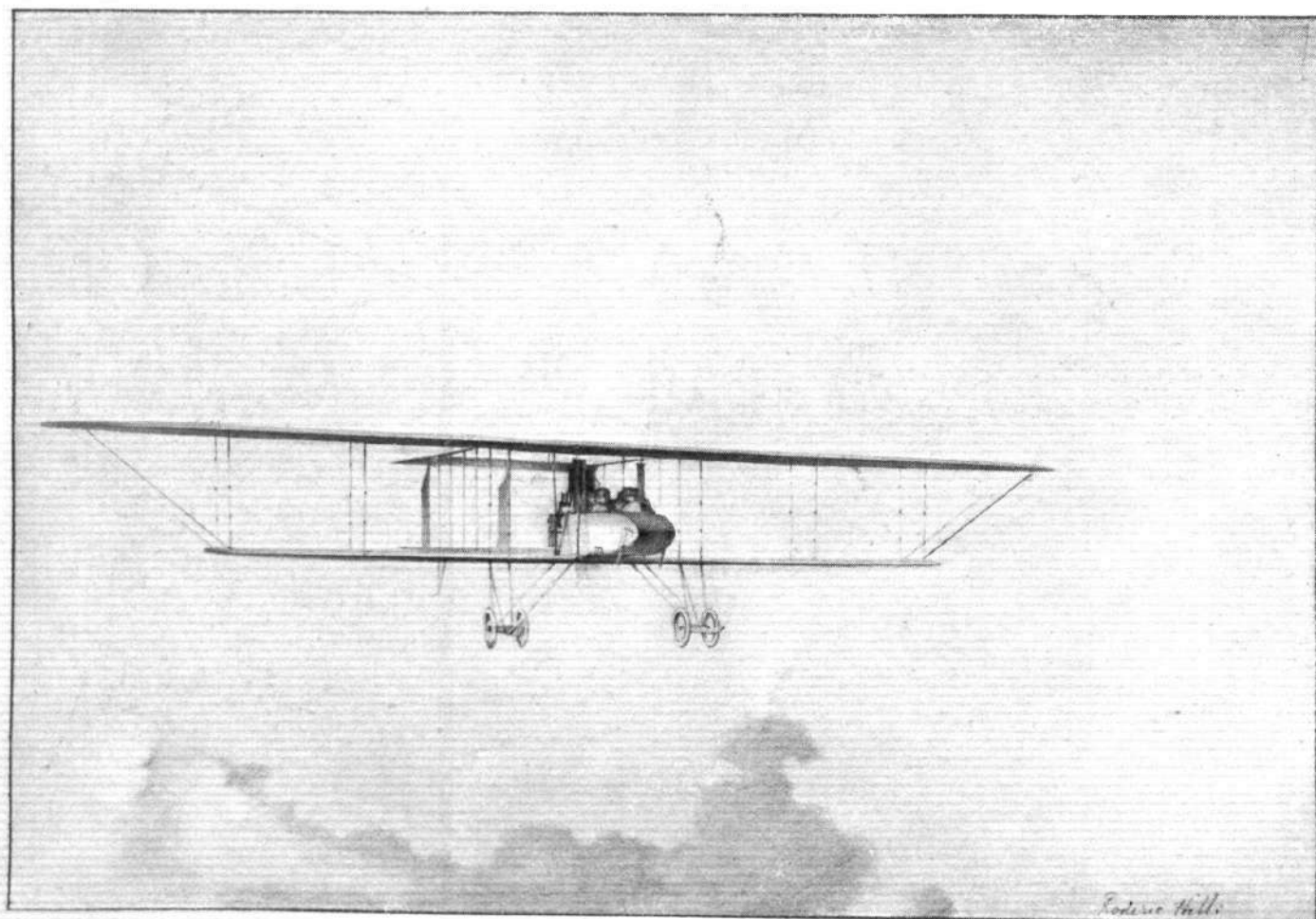
There was a pleasant absence of wind last Saturday, which not only made flying pleasant but agreeable to watch as well. Several exhibition flights were made prior to the racing. Those who contributed to the work were Marcus D. Manton on the 50 h.p. G.-W. 'bus, Louis Noel on the Maurice Farman, Pierre Verrier on a new Maurice Farman (70 h.p. Renault, front elevator), E. Baumann on the 60 h.p. Caudron, G. L. Temple on his 50 h.p. Blériot, J. L. Hall on a home-built Blériot with a red breast, W. L. Brock on the 80 h.p. Blériot, Philippe Marty on the 50 h.p. Morane-Saulnier, G. M. Dyott on his British-built mono., Claude Grahame-White flew both the Maurice Farman and the Morane-Saulnier, whilst R. H. Carr made his début on the now all-British Grahame-White char-à-bancs, which has been fitted with a 100 h.p. Green engine with which it flies quite well. Temple's flights were quite features of the afternoon, for he ascended to great heights and returned to earth with splendid spiral descents; at one time he reached a height of 5,000 ft. The speed contest was flown as usual in two heats of six laps each, and a final heat of eight laps. Four started in the first heat, viz., R. H. Carr on the 50 h.p. G.-W. 'bus (4 mins. 28 secs.), Marcus D. Manton on the later type 'bus

(3 mins. 20 secs.), Pierre Verrier on a new 70 h.p. Maurice Farman (1 min. 53 secs.), and Philippe Marty on the 50 h.p. Morane-Saulnier (scratch). This heat produced several exciting passes from time to time, on one occasion Marty, skimming along the ground, barely had room to pass underneath Verrier. Marty flew a splendid race, and only lost first place by 3 secs., Verrier getting home first. Manton and Carr came in third and fourth respectively some way behind. The second heat resulted in a fine finish. Baumann, the limit man, on the 60 h.p. Caudron, led all the way, but only won by 3 seconds, for G. M. Dyott on his mono., who started third with 55 seconds start, came in second, with Grahame-White on the Morane-Saulnier (scratch) only  $\frac{1}{2}$  second behind. Brock, on the Blériot, who received 8 seconds start, came in fourth some 10 seconds after the third man. Noel, who started second, did not finish. The final heat evolved itself into two good flights for first and third places between Dyott and Baumann, and Marty and Verrier, respectively. Dyott, who flew his machine in magnificent style both in this and the second heat, got off after a very short run, and obtained first place by a bare  $\frac{1}{2}$  second. A little later Verrier approached the finishing line, with Marty following him up. The latter passed the former just before the line, and got in third by 1 second. After the racing several passengers were taken up by the Grahame-White pilots, but there were so many applicants for flights that it was dark before they could all be taken up, so there were several disappointments.



### Aerial Mails in France.

THE success of the first official aerial mail in France has led M. Masse, the Minister of Commerce, to arrange a more elaborate experiment. In this trial Martinet is to fly a Dautre biplane, a feature of which is the automatic stability device, from Paris to Nice, stopping *en route* at Nevers, Lyon and Orange, at each of which places he will leave a bag of mails and take on mails for the south. The distance is 840 kiloms., and the aviator will be allowed nine hours for the trip. The Dautre machine, which is of 16 metres span, is fitted with a 100 h.p. Anzani motor.



An impression of the Grahame-White char-à-bancs flying at Hendon. From an original drawing by Roderic Hill.





A BEAUTIFUL SUNSET PICTURE AT THE HENDON AERODROME.—Mr. W. L. Brock passing No. 1 pylon on his Bleriot during a race.

## THE D.F.W. MILITARY MONOPLANE.

BEFORE beginning a description of the machine itself, a few words about the German Aircraft Works (Deutsche Flugzeug Werke) in which these machines are built may not be amiss. One of the accompanying photographs

Our scale drawings and photographs this week illustrate the military type monoplane, which the school monoplane resembles in every respect, with the exception of the steel bridge girder fitted underneath the wings of the



Three-quarter rear view of the D.F.W. military monoplane.

gives a good idea of the spacious shops of this firm, whose works are situated at Lindenthal, near Leipzig, Germany. The shops are equipped with the most up-to-date machinery, and in the three erecting shops as many as 20 machines can be assembled at a time. The number of employees, we understand, has passed 300, and is constantly on the increase. At the present time four standard types of machines are turned out, *i.e.*, a school monoplane, a military monoplane, a military biplane and a hydro-biplane. All of these types are designed with a view to obtaining a certain amount of inherent

latter. The *fuselage* is built up of a framework of steel tubes of ample dimensions, laterally stayed by three-ply wood panels. The section of the *fuselage* is a very elongated ellipse, having its major axis vertical. Inside the *fuselage* are the pilot's and passenger's seats, arranged tandem fashion, the passenger occupying the front seat, from whence he has an excellent view of the ground beneath, and, if necessary, can make any little adjustments of the engine that may be required. The pilot's seat is placed sufficiently far behind the trailing edge of the main planes to give him an unrestricted view in a



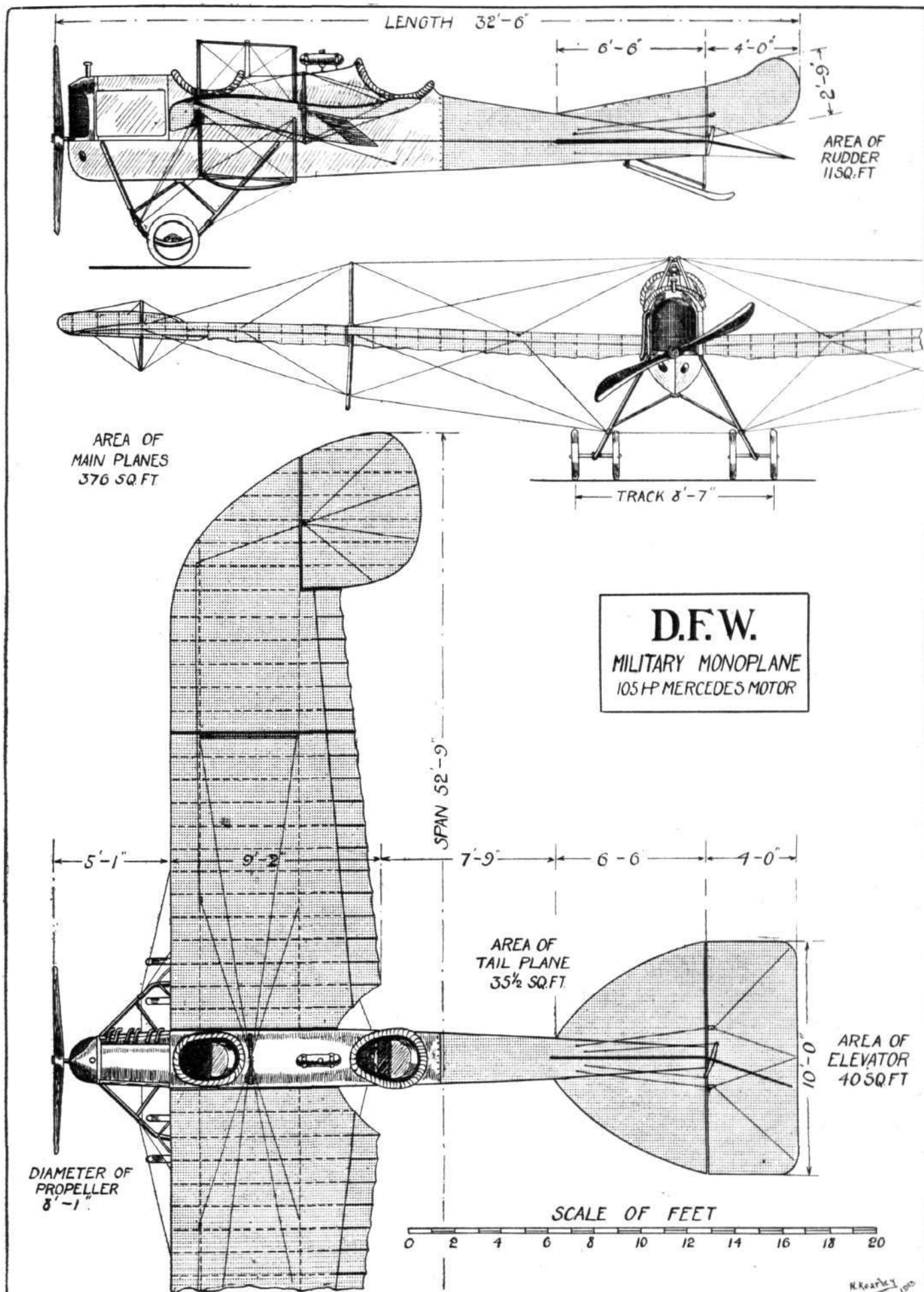
Three-quarter rear view of a D.F.W. monoplane, school type. It will be noticed that this machine is almost exactly similar to the military type, except for the steel bridge girder underneath the wings.

natural stability, as will be explained later. Another point which has received careful attention is the standardisation of all parts, most fittings on both monoplanes and biplanes being interchangeable.

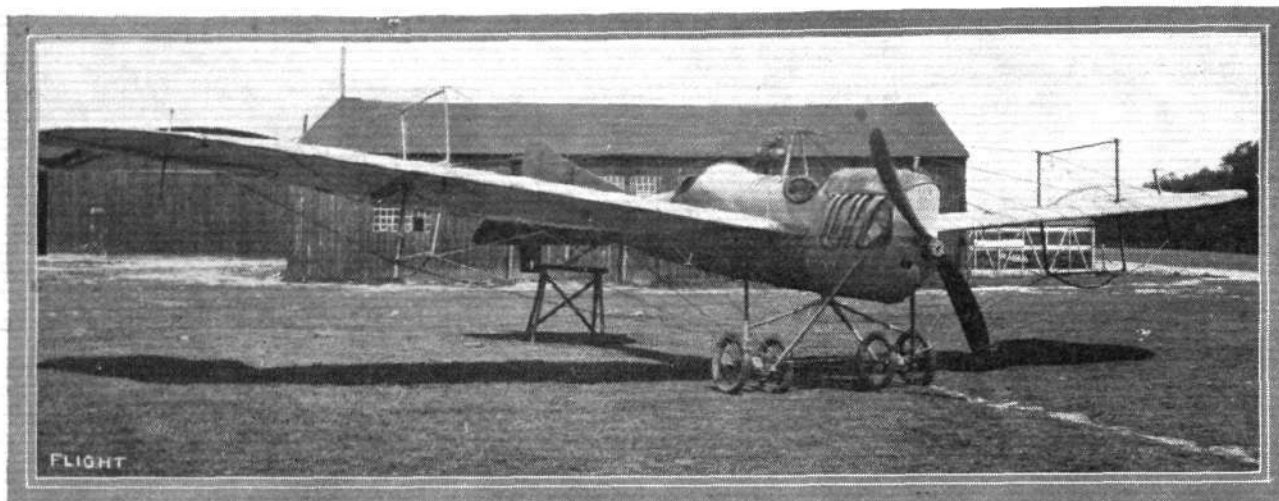
downward direction, and so enable him to judge his landings with a great amount of accuracy.

Only engines of the stationary type are fitted, as the constructors of the machine contend that, although some-





THE D.F.W. MONOPLANE.—Plan, side and front elevation to scale.



The D.F.W. monoplane on which Lieut. von Hiddesen secured the first prize in the Prince Henry Reliability Trials some time ago.

what heavier than rotary engines, the stationary engine is more reliable and economical in fuel consumption, two most important qualities in a machine for military use.

The dome-shaped honeycomb radiator is mounted directly in front of the engine which position, in addition to being the best possible for cooling purposes, gives a good streamline form to the *fuselage*. The bonnet over the engine consists of fine wire gauze, making all engine parts visible, preventing overheating and affording accessibility, as the bonnet opens in sections. The petrol and oil tanks are situated between the passenger's and pilot's seats, and a smaller service tank is mounted on top of the *fuselage*.

An inspection of the plan view will show that the main planes possess that feature which seems to characterise the majority of German machines, *i.e.*, the back swept wing tips, set at a small negative angle of incidence. In this machine the outer extremities of the wings take the shape of *ailerons*, being hinged to the rear spar instead of being formed by extending the outer

ribs backwards, which is the usual method of construction. The method of having the extensions hinged in this way has proved very satisfactory.

The tail planes consist of a stabilizing plane, which is not, however, rigidly connected to the *fuselage*, but is pivoted, and may be adjusted from the pilot's seat by means of a rotatable hand wheel situated outside the *fuselage*, and within easy reach of the pilot's seat. Hinged to the trailing edge of this plane is the undivided elevator. On top of the *fuselage* is the rudder, which is hinged to the trailing edge of a small vertical fin. A well-sprung tail skid protects the tail planes from contact with the ground.

In front of the pilot are the usual set of control levers, consisting of a rotatable hand wheel mounted on a central tubular column, which, in turn, is mounted on a transverse rocking shaft. A to-and-fro movement of the column operates the elevator, whilst rotation of the wheel actuates the *ailerons*. The rudder is operated by means of a footbar. Ignition and throttle levers are mounted on the right hand side of the pilot's seat, and on the hand wheel is a switch, while a self-starter is fitted on the instrument board in front of the pilot.

The chassis consists of two "U"-shaped steel tube frames, braced by tubes from a point underneath the *fuselage*, the whole forming a very strong structure which offers comparatively little head resistance. Two pairs of wheels sprung in the usual way by means of rubber shock absorbers are mounted on the U-shaped frames, and facilitate starting from and alighting on the ground. If desired brakes can be fitted.

Below we give a few particulars which, in connection with the scale drawings, should give a very good idea of the main characteristics of these machines which have met with a good deal of success in competitions, while a number of them have been purchased by the German military authorities:—

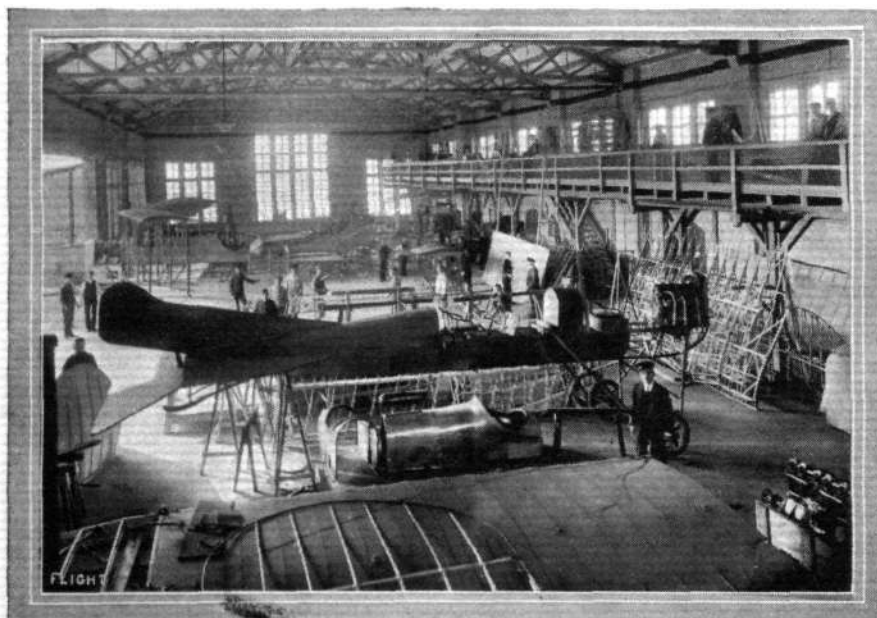
Weight, empty: 1,300 lbs.

Useful load: 440 lbs. and fuel for a 4 hours' flight.

Average speed loaded as above: 73 m.p.h.

Climbing speed: 3,300 ft. in 15 mins.

Gliding angle: 1 in 7.5.



General view of one of the three erecting shops of the German Aircraft Works, Ltd. (D.F.W.), at Lindenthal, near Leipzig, Germany.



## PASSENGER AIRSHIPS IN GERMANY.

A VERY interesting lecture was given the other evening before the Women's Institute by Eleanor Lady Shelley, who it will be remembered is a sister of the late Hon. C. S. Rolls, and has always taken a very active interest in aeronautical progress. After dwelling upon the use of aircraft in national defence, Lady Shelley went on to recount her experiences in the air, dating back to the time when the ambition of "flyers" had to be satisfied with ballooning. With regard to the future, Lady Shelley said that she looked forward to seeing within the next few years regular services between England and the continent, and services to take people rapidly to their work. As our readers know from the photos which we have been able to reproduce from time to time through the kindness of Lady Shelley (a further set appearing in this issue on pages 1220-21), she has spent some time in Germany and made a number of trips in the various types of airships used for passenger work, which she described as modern luxuries in aerial travel.

Lady Shelley went on to describe the "Parseval" and "Zeppelin" type of ship, with their wonderful standard of comfort for passengers, and the delights of a voyage over Berlin in one of these luxurious vessels. It is

difficult, she said, to believe that one is in the air. The movement is usually gentle, although bad sailors might find the motion sometimes disagreeable owing to an occasional pitch and toss when flying high.

There are spacious windows in these dirigibles, which hold a crew in two gondolas and about fourteen passengers. These windows open and close at either end of the passenger car. An excellent meal is served during the voyage, at little tables, as in a restaurant, a menu being provided. These lunches are, of course, cold, as no heating is allowed. When dark, the car is lit by electric light. Passengers are usually busy the whole time writing picture postcards to their friends, which are stamped by an attendant, and afterwards posted on return to earth. There is plenty to do besides postcard writing and examining the country out of the windows. There is the barograph to watch, and the course of the journey to be followed on the map.

A considerable portion of the German Army are trained to start these dirigibles, as there is usually a military detachment on duty at the starting place. So popular have these flights become in dirigibles that seats have to be booked for days ahead. Tickets cost £5 and £10, according to the length of the flights.

## ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending October 31st:—

**No. 1 Squadron, South Farnborough.**—The "Delta" and "Beta" were out most days during the week carrying out instructional and reconnaissance flights.

**No. 2 Squadron, Montrose.**—The machines of "B" and "C" Flights were up daily. 1,881 miles in all were flown. Two more officer pilots arrived by air from Farnborough during the week.

**No. 3 Squadron, Netheravon.**—BE, H. Farman and Blériot machines were up most days, being flown by officer and N.C.O. pilots. The newly joined officers obtained considerable practice during the week.

**No. 4 Squadron, Netheravon.**—"C" flight were at work daily.

**No. 5 Squadron, South Farnborough.**—Avros and M. Farmans

were flown by officer pilots daily throughout the week. The Dover detachment have been busy. Capt. Mellor, who had a rib broken last week in an aeroplane accident, is progressing favourably.

**Flying Depot, South Farnborough.**—Various experiments were continued during the week.

**General Remarks.**—Prince and Princess Alexander of Teck paid an informal visit to the sheds on the 30th ult. The First Lord of the Admiralty visited the headquarters of the Military Wing on the 31st ult., and made flights in airships and aeroplanes.

## THE ROYAL FLYING CORPS.

The following announcement appeared in the *London Gazette* of the 4th inst.:—

**R.F.C.—Military Wing.**—*Special Reserve of Officers.*—Second Lieut. (on probation) Sidney V. Sippe resigns his commission. Dated November 5th, 1913.

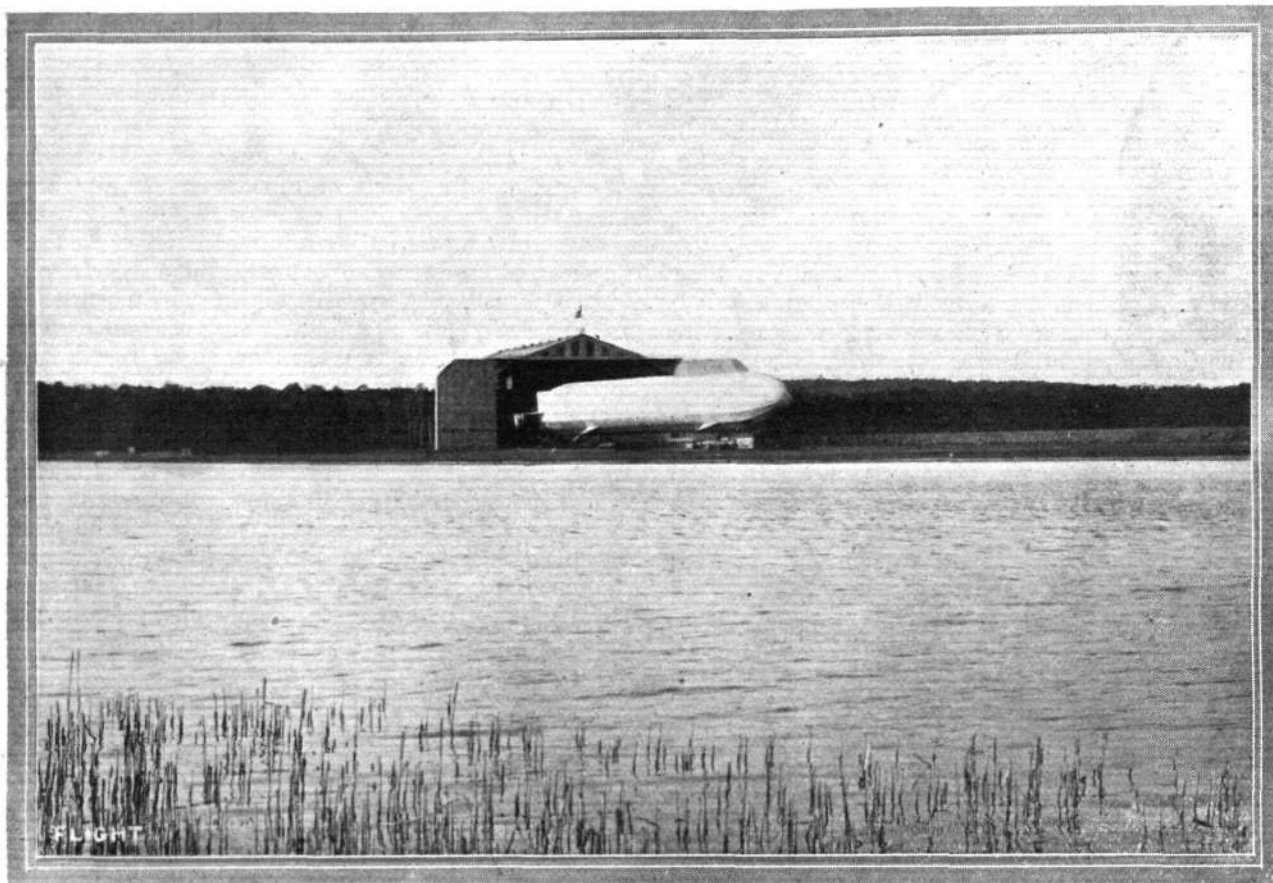
## AEROPLANE DESCRIPTIONS, WITH SCALE DRAWINGS.

FOR the information of our readers, the following detailed descriptions of machines have appeared in FLIGHT. Most of these copies are still obtainable from the Publishers, 44, St. Martin's Lane, W.C., at 6½d. each, post free, for those published during 1911 and 1912, and for the current year (1913) the charge is 3½d., post free.

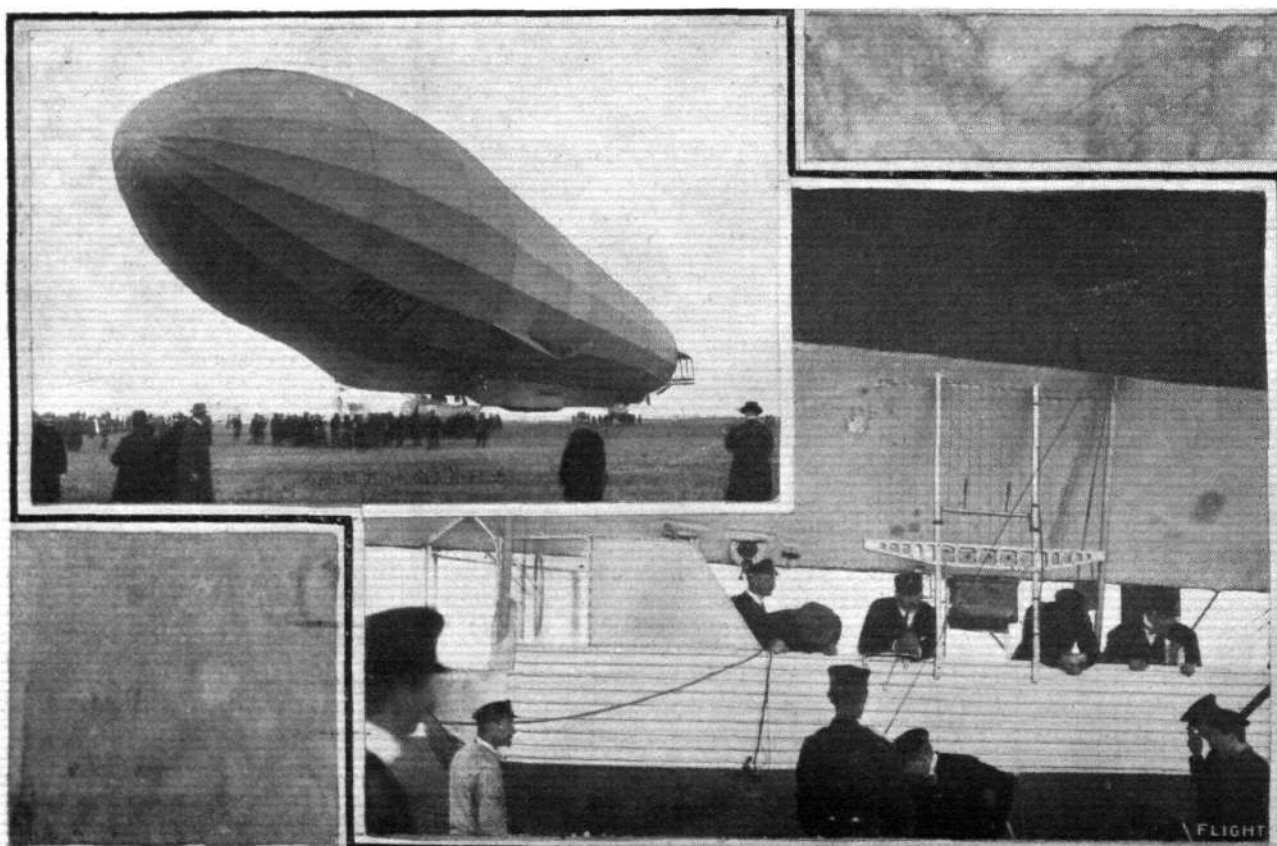
Machine.	Date Published.	Machine.	Date Published.	Machine.	Date Published.
Army biplane...	1911. July 15	Avro monoplane ...	Oct. 12	Borel hydro-monoplane ...	July 26
Avro biplane ...	Nov. 4	Blackburn monoplane ...	Nov. 16	Borel Military biplane ...	Aug. 23
Blackburn monoplane ...	Aug. 5	Caudron biplane ...	Nov. 30	Breguet biplane ...	June 14
Breguet biplane ...	July 22, July 29	Caudron racing monoplane ...	May 11	Bristol monoplane ...	May 17
Bristol Military biplane ...	Mar. 18	Cody Military biplane ...	Sept. 7	British Deperdussin hydro-monoplane	May 10
Bristol monoplane ...	Sept. 30	Cody monoplane ...	June 29	Burgess flying boat ...	June 28
Deperdussin monoplane ...	Aug. 19	Coventry Ordnance biplane ...	May 18	Caudron hydro-biplane ...	Aug. 2
Dunne monoplane ...	June 24	Deperdussin monoplane	Feb. 10, Sept. 7	Cody waterplane ...	Aug. 16
Etrich monoplane ...	Nov. 11	Flanders monoplane ...	Mar. 23, Dec. 21	Dyott monoplane ...	April 26
Fritz monoplane ...	Aug. 12	Handley Page monoplane ...	Oct. 26	E.A.C. monoplane ...	May 3
Grahame-White Baby biplane	Mar. 25	Henry Farman biplane ...	Oct. 19	Flanders biplane ...	Oct. 25
Martin-Handasyde monoplane	Mar. 25	Jezzi biplane ...	Dec. 14	Grahame-White biplane ...	Feb. 1
Morane monoplane ...	July 29	Lake Flying Co.'s hydro-biplane	Dec. 7	Grahame-White 5-seater biplane	Oct. 11
Nieuport 2-seater monoplane	Oct. 7	Maurice Farman biplane ...	July 6	Lake Flying Co.'s waterplane	July 19
Paterson biplane ...	Dec. 2	Morane-Saulnier monoplane	Feb. 3	Martin-Handasyde monoplane	Jan. 4
Roe triplane ...	April 1	New Avro biplane ...	Mar. 30	Morane-Saulnier monoplane	May 24
Sanders biplane ...	Mar. 4	Paulhan-Tatin monoplane ...	Feb. 17	Nieuport hydro-aeroplane ..	April 19
Short biplane...	June 10	Short monoplane ...	Mar. 9	Parsons biplane ...	June 21
Short double-engine biplane	Sept. 9	Sommer biplane (all steel) ...	Jan. 27	Radley-England waterplane	April 12, Aug. 16
Star monoplane ...	July 1	Sopwith-Wright biplane ...	Nov. 23	Short biplane...	June 7
Valkyrie monoplane ...	April 1	Viking I biplane ...	Jan. 20	Sopwith waterplane ...	Aug. 16
Weiss monoplane ...	June 17		1913.	"Tong-Mei" tractor biplane	May 31
Avro Military biplane ...	Aug. 31	Avro hydro-biplane ...	July 12	Westlake monoplane ...	Sept. 13
		Blériot sand yacht ...	Aug. 9	Wright hydro-biplane ...	Sept. 6

# **PASSENGER AIRSHIPS IN GERMANY.**

(See page 1219.)

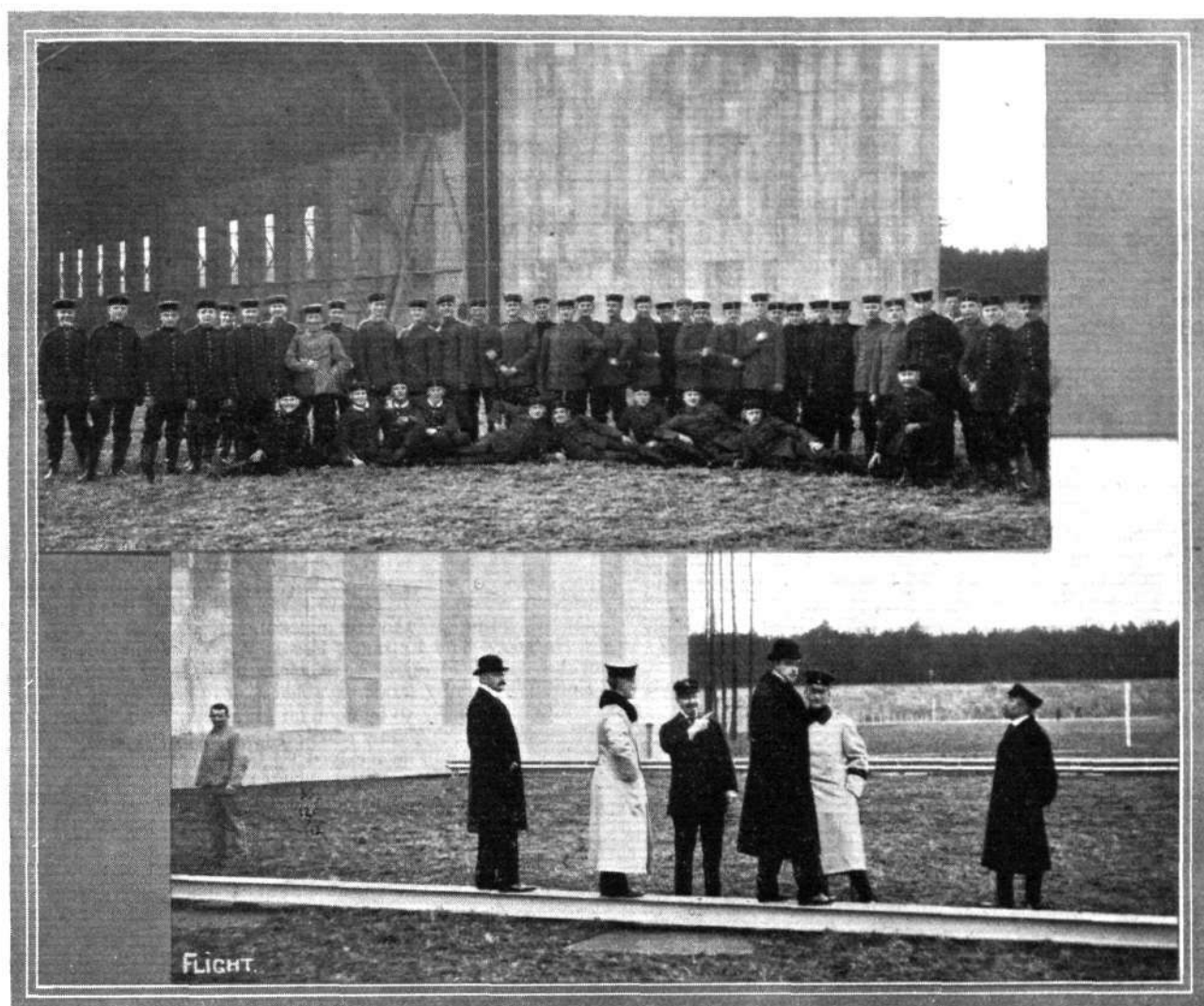


The "Hansa" emerging from her hangar at Potsdam.

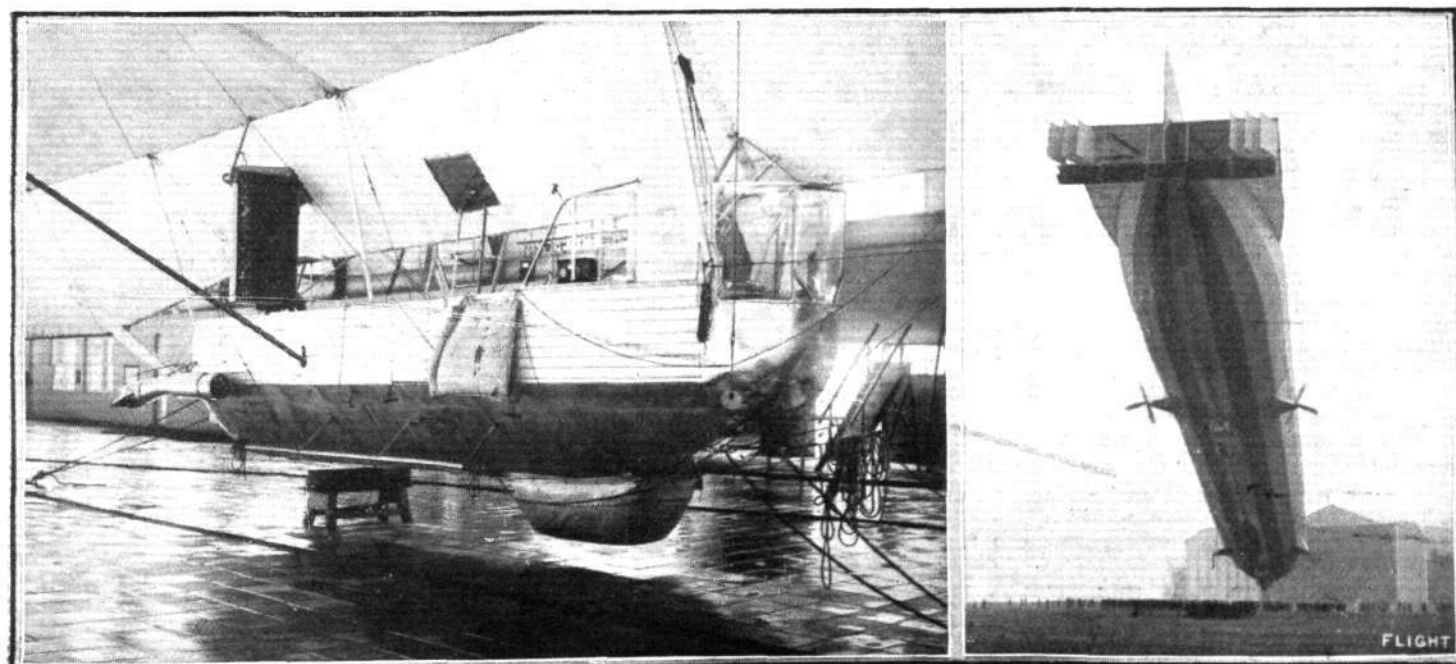


The front gondola of the "Hansa" and a general view of the dirigible from the front.





Soldiers at Potsdam employed to assist in handling the aircraft. Below are seen the King of Portugal at Potsdam standing on one of the rails, and on the extreme right (with cap on) is the Captain of the "Sachsen."



The rear gondola of the "Hansa," with a general view of the airship from behind.

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

**British Empire Michelin Cup No. 1, £500.**  
THIS prize not having been won on the closing date, October 31st, 1913, the Michelin Tyre Co. has notified the Royal Aero Club that it will extend the date to November 14th, 1913.

The following competitors will make attempts to win this prize :—  
H. G. Hawker... Sopwith Biplane ... 100 h.p. Green  
R. H. Carr ... Grahame-White Biplane... 100 h.p. Green  
The Rules are as under :—

**THE BRITISH EMPIRE MICHELIN CUP NO. 1.**  
(Under the Competition Rules of the Royal Aero Club.)

The Michelin Tyre Company has presented to the Royal Aero Club of the United Kingdom, for competition by British aviators, a trophy of the total value of £500.

Annually, for five years, a replica of this trophy, together with a sum of £500 in cash, will be given to the successful competitor. This trophy will be competed for under the following conditions :—

## CONDITIONS.

1. The winner for the year 1913 shall be the competitor who shall have accomplished the longest distance on an aeroplane in flight round the course, Brooklands and Hendon, on any day up to and including November 14th, 1913.
2. Flights shall be made between 7 a.m. and one hour after sunset.
3. No replenishments of oil, fuel, etc., will be permitted.
4. No repairs may be carried out after a start has been made.
5. Competitors shall make periodical compulsory stops of not less than five minutes, with engine stopped, on completing an entire circuit of the course plus one section, e.g., starting from Brooklands the competitor would pass Hendon, Brooklands, and alight at Hendon. His next flight would be from Hendon, passing Brooklands, Hendon and alighting at Brooklands, and so on.
6. Landing at any point other than a proper landing place terminates a flight, and the competitor will then be credited with the mileage of the sections which he has completed, in conformity with the regulations.
7. A minimum distance of 300 miles must be accomplished.
8. Starts may be made from any of the two points of the course.
9. The entrant, who must be the person operating the machine, must be a British subject, flying on a British-made aeroplane, must hold an Aviator's Certificate, and must be duly entered on the Competitors' Register of the Royal Aero Club.
10. The complete machine, and all its parts, must have been entirely constructed within the confines of the British Empire, but this provision shall not be held to apply to raw material.
11. An entrance fee of £1 must accompany every notification of an attempt, and at least three clear days' notice must be given to the Secretary, Royal Aero Club, 166, Piccadilly, London, W. A competitor must further deposit a sum of £10 on account of expenses, if any, of officials. Any balance not so expended will be returned to the competitor.
12. Should any questions arise at any time after the date of entry as to whether a competitor has properly fulfilled the above conditions, or should any other question arise in relation to them, the decision of the Royal Aero Club shall be final and without appeal.
13. A competitor by entering waives any right of action against the Royal Aero Club or the Michelin Tyre Co. for any damages sustained by him in consequence of any act or omission on the part of the officials of the Royal Aero Club or the Michelin Tyre Co., or their representatives or servants, or any fellow competitor.
14. The aeroplane shall at all times be at the risk in all respects of the competitor, who shall be deemed by entry to agree to waive all claim for injury either to himself or his aeroplane, or his employees or workmen, and to assume all liability for damage to third parties or their property, and to indemnify the Royal Aero Club and the Michelin Tyre Co. in respect thereof.
15. The Royal Aero Club reserves to itself the right to add to, amend, or omit any of these rules should it think fit.

## British Empire Michelin Cup No. 2, £800.

The closing date for this competition is November 30th, 1913. The rules can be obtained on application to the Secretary of the Royal Aero Club.

**Daily Mail £5,000 Prize, 1914. Circuit of Great Britain.**  
(Under the Competition Rules of the Royal Aero Club.)

## PRELIMINARY ANNOUNCEMENT.

The proprietors of the *Daily Mail* have offered the sum of £5,000 to be awarded to the entrant of the aeroplane which shall first have

completed a prescribed circuit round Great Britain in flight within a period not exceeding 72 hours, under the following regulations :—

## Regulations.

**Date of Contest.**—The competition will take place, probably, in July or August, 1914, but the exact date will be announced later. It is proposed to keep the Competition open 14 days.

**Sunday Flying Prohibited.**—There shall be no flying in the Competition between midnight on Saturday and midnight on Sunday, and the period shall not count in the 72 hours.

**Qualification of Competitors.**—Both the entrant and pilot or pilots must be British subjects and duly entered on the Competitors' Register of the Royal Aero Club. Pilots must hold an aviator's certificate issued by the Royal Aero Club or other club affiliated to the International Aeronautical Federation.

A passenger must be carried throughout the flights, and the combined weight of the pilot and passenger must be not less than 264 lbs., any deficiency in weight being made up by means of ballast. Pilots and/or passengers may be changed during the contest.

**Qualification of Aircraft.**—The complete aircraft and all its parts, including the motor, must have been entirely constructed within the confines of the British Empire, but this provision shall not be held to apply to raw material.

**Entries.**—The Entrance Fee is £100 per aircraft, and entries will be received up to 12 o'clock, noon, May 30th, 1914. The Entrance Fee of £100 is payable either in one sum or as follows :—  
£50 by noon on May 30th, 1914.  
£50 by noon on June 20th, 1914.

Late entries will be received up to 12 noon, June 30th, 1914, in which case the Entry Fee will be £150.

The Entry Form, which must be accompanied by the Entrance Fee, must be sent in to the Secretary, Royal Aero Club, 166, Piccadilly, London, W.

No part of the Entrance Fee is to be received by the *Daily Mail*. All amounts received will be applied towards payment of the expenses of the Royal Aero Club in conducting the competition. Any balance not so expended will be refunded to the entrants.

**Course.**—The course will be a circuit of Great Britain, and the official starting-place and controls will be announced later. Competitors may make the circuit starting in either direction.

**Controls.**—The controls will be situated at or near each of the towns selected for the official controls, and competitors must alight at each of these controls for purposes of identification.

The aircraft must remain one hour in each control. During the first 30 minutes it must be entirely at the disposal of the officials for examination; the last 30 minutes may be utilised for replenishments and repairs. This period of one hour will not count in the 72 hours.

There is no restriction as to the number of starts made by a competitor, but in every case the start must be made from the official starting place.

**Stoppages.**—Stoppages between the controls are not prohibited, but all alightings must be effected on the sea, an inlet of the sea, an estuary, or a harbour. An alighting on land or inland water will terminate the attempt. (For the purpose of this contest the Caledonian Canal will be considered as the sea.)

**Towing.**—Towing is not prohibited, but the finishing line must be crossed in flight.

**Repairs.**—Individual replacements and repairs to the aircraft and motor may be made *en route*, but neither may be changed as a whole. The aircraft may be taken ashore for such repairs and replacements. Any time thus spent on repairs will count in the 72 hours.

No repairs or replenishments may be effected during the 30 minutes' allowance for official inspection in controls.

Five parts of the aircraft and five parts of the motor will be stamped or otherwise marked, and at least two marked parts of each of these five must be in place on arrival at each control.

**Safety Appliances.**—Competitors and their passengers must be equipped with life-belts or other appliances for keeping themselves afloat.

**Shed Accommodation.**—Accommodation for the aircraft will be provided at or near the official starting place free to each competitor for one week prior to start of the competition till the closing date.

## General.

1. A competitor, by entering, thereby agrees that he is bound by the regulations herein contained or to be hereafter issued in connection with this competition.



2. The interpretation of these regulations or of any to be hereafter issued shall rest entirely with the Royal Aero Club.

3. The competitor shall be solely responsible to the officials for the due observance of these regulations, and shall be the person with whom the officials will deal in respect thereof, or of any other question arising out of this competition.

4. A competitor, by entering, waives any right of action against the Royal Aero Club or the proprietors of the *Daily Mail* for any damages sustained by him in consequence of any act or omission on the part of the officials of the Royal Aero Club or the Proprietors of the *Daily Mail* or their representatives or servants or any fellow competitor.

5. The aircraft shall at all times be at the risk in all respects of the competitor, who shall be deemed by entry to agree to waive all claim for injury either to himself, or his passenger, or his aircraft, or his employees or workmen, and to assume all liability for damage to third parties or their property, and to indemnify the Royal Aero Club and the proprietors of the *Daily Mail* in respect thereof.

6. The Committee of the Royal Aero Club reserves to itself the right to add to, amend or omit any of these rules should it think fit.

HAROLD E. PERRIN, Secretary.

166, Piccadilly, W.

## FROM THE BRITISH FLYING GROUNDS.

### Royal Aero Club Eastchurch Flying Grounds.

OWING to adverse weather conditions during the past week the amount of flying has been necessarily small. On Wednesday, although the wind was blowing in gusts up to quite 40 m.p.h., Sub-Lieut. Marix, R.N., took up Short 62. He kept the aircraft under wonderful control, and after a good deal of buffeting about, effected a clever landing.

Both Commander Samson and Paymaster Barker are ill, and, in the case of the latter, very seriously, but he is improving satisfactorily.

The Dunne biplane was out on Saturday for an engine test, but no attempt was made to fly. Sub-Lieut. Pierce, R.N., was up on Short 62 for an extended flight, getting up to a good height. Sub-Lieut. Rainey, on an Avro, was also up in the afternoon, and Lieut. Ireland made a trip on Bristol 24.

### Brooklands Aerodrome.

ON Friday, last week, Lieuts. MacNeece and Hinds passed their *brevet* tests in good style on Bristol biplanes. Mr. Pixton has concluded his engagement as instructor at the Bristol School, but it is not likely that so able a pilot will long be disengaged.

On Saturday there was much activity at the Vickers and Bristol schools. Messrs. Barnwell and Knight were out on different machines. Mr. Busteed was tuning up the new Bristol tractor biplane, Mr. Merriam was busy with pupils, the Flanders biplane was flying well, and Mr. Pixton made a trip on a Sopwith biplane. Mr. Hawker and Mr. Fred May (Green Engine Co.) were getting the 100 h.p. Green engine into good trim preparatory to a further attempt on the Michelin prizes by Mr. Hawker.

A very strong wind on Sunday prevailed and tested the qualities of the machines taking the air. Mr. Busteed was first out, on the Bristol tractor biplane, followed by the Martinsyde monoplane and the Flanders biplane, all the machines flying extremely well in a bumpy wind. Mr. Hawker made some test flights in readiness for his further Michelin attempts, and Mr. Fred May was again in attendance to watch the engine's behaviour. The ballot for the free passenger flight had to be drawn no less than three times ere a claimant put in an appearance, in the person of Mr. Victor Stampson, of The Gardens, Pyrford Court, Woking, who enjoyed a trip on the Flanders biplane.

**Bristol School.**—On Monday, Tuesday, Wednesday and Thursday last week no flying all day owing to wind and rain. Very busy in hangars.

On Friday Merriam testing new biplane, afterwards up with Lieut. Bridson. Lieut. Hinds followed with solo, and had to come down owing to wind suddenly rising. Merriam afterwards tested weather and found it very bad. Later Pixton out on a Bristol tractor biplane.

In the afternoon Merriam tested conditions, then sent Lieut. Hinds for his ticket, which was obtained in good style. Lieut. MacNeece practising landings, and after this pupil passed the test for his *brevet*, flying in excellent style. Merriam up behind Lieut. Bridson on straights and circuits. Then Mr. MacDonnell and Lieut. Warren for solos. Darkness prevented flying.

**Howard-Flanders School.**—Friday, last week, Dukinfield Jones out in afternoon, testing alteration to elevator for 10 mins. Then handed machine over to Barnwell, who did few minutes' solo, and then carried lady passenger for quarter of an hour.

Barnwell out for about an hour, Saturday, carrying four passengers, and on Sunday he was out again for half-hour, carrying two passengers in bumpy wind. Barnwell expressed himself delighted with the Flanders biplane, and remarked on her exceptionable stability and comfort in a wind.

**Vickers School.**—Monday, last week, in morning, Paterson test biplane 26; Messrs. Pelham and Malcolm alone. Knight on biplane 20 with Mr. Hinshelwood. Barnwell test No. 5 mono.

Barnwell, Friday morning, on biplane 26 with Lieut. Barton. Paterson with Messrs. Macdonell and Hinshelwood. Messrs. Malcolm and Batty-Smith alone. In afternoon, Barnwell on biplane 20 with Capt. Macdonell. Messrs. Frankland, Pelham,

Malcolm and Hinshelwood alone. Paterson on biplane 26, Messrs. Batty-Smith, Malcolm and Frankland alone. Barnwell test No. 5 mono., Messrs. Chataway and Webb straights.

Saturday morning, Paterson test biplane 20, then with Lieut. Barton. Messrs. Macdonell and Hinshelwood alone. Barnwell test biplane 26, then with Capt. Pelham. Messrs. Malcolm, Batty-Smith and Pelham alone. Knight with Messrs. Batty-Smith and Barton.

In afternoon Barnwell test biplane 26, Messrs. Frankland, Pelham, Batty-Smith and Malcolm alone. Knight test biplane 20, then with Lieut. Barton, Messrs. Hinshelwood and Macdonell solos.

### Eastbourne Aerodrome.

OWING to the inclemency of the weather, no school work was possible last week until Saturday, when, taking advantage of the temporary improvement, Gassler had the E.A.C. 'bus out, and after the usual test stunt sent Mr. Thornely up for his ticket. Mr. Thornely flew steadily and well, and landed exactly on the mark each time. After he had completed his tests, the 28 Blériot was brought out, and Mr. Hunt put in some practice, doing several straights in good style. During the afternoon, one of the school's ex-pupils, Lieut. Rainey, paid the aerodrome a visit. Flying a 50 Avro from Eastchurch, he descended for petrol, and left again almost immediately for Shoreham.



Lieut. Oxlade, R.N., who has just taken his Royal Aero Club *brevet* on an E.A.C. biplane at the Eastbourne Aerodrome.

Sunday and Monday were both indoor days, but on Tuesday morning Gassler had Mr. Hunt up in the pilot's seat of the E.A.C. 'bus for several circuits, until a rather bumpy breeze sprang up and put an end to school work.

### London Aerodrome, Collindale Avenue, Hendon.

**Grahame-White School.**—Monday, last week, Mr. C. Draper circuits, &c. Messrs. Francis, Von Segebaden, Eldridge-Green straights with instructor, Manton in passenger seat. Mr. Strange circuits, afterwards Mr. Francis solo straights.

Thursday, Mr. C. Draper and Mr. Strange circuits, and on Friday, Messrs. Howarth, North, Eldridge-Green, Kershaw, and Clarke straights with Mr. Birchenough. Mr. Strange circuits. Mr. Norris (new pupil) rolling with instructor.

**W. H. Ewen School.**—Monday, last week, school was out at 7.15 a.m. After test flight by M. Baumann on *brevet* machine, Messrs. H. Scott and R. MacGregor did straight flights on same machine. On the 35 h.p. Caudron No. 2 Mr. F. W. Goodden was instructing Messrs. Badgery, Cowling, Johnson, and Lieut. Kinnear, who were rolling.

Tuesday, Wednesday and Thursday were not favourable for practice. On Friday pupils were out at 8 a.m. on No. 2 with Mr. F. W. Goodden instructing. Messrs. Badgery, Cowling, and Lieut. Kinnear were doing straights. Messrs. Wigget and J. Bankes-Price rolling. At 4 p.m., M. Baumann out with pupils on *brevet* machine, Messrs. Scott and MacGregor doing half circuits. Mr. F. Goodden was out with Messrs. Badgery, Johnson, and Lieut. Kinnear, who were doing straights, and Messrs. J. Bankes-Price and Wigget rolling.

At 11 a.m. on Saturday M. Baumann was out on *brevet* machine with Mr. Badgery, who was doing straights, and Mr. Scott, who was doing circuits. On Caudron No. 2 Mr. F. Goodden was instructing Messrs. Cowling, Johnson, and Lieut. Kinnear, who were rolling.

**Hall School.**—Monday, Tuesday, Wednesday and Thursday last week—just wind, wind, wind. Friday, Hall flying on Gnome monoplane. Denis Ware out on 35 Caudron biplane, and Saturday Hall exhibits on Blériot; Ware flying at 600 ft. on Caudron.

## Salisbury Plain.

**Bristol School.**—No flying all day owing to wind and rain last week on Monday or Tuesday, and the same conditions prevailed on Wednesday and Thursday.

Voigt for two trials on Friday, and then Lieut. Huish did three solos, Mr. Courtney two solos, and Lieut. Marsh one solo. Voigt with a passenger on a biplane.

**Royal Flying Corps. 3rd and 4th Squadrons (Netheravon).**—On Monday of last week a very high wind was blowing, but Capt. Fox was out on the 70 h.p. Blériot 221, flying for 16 mins. Similar weather conditions prevailed on Tuesday, and only one flight was made, Lieut. Cholmondeley on H. Farman 352, flying to Grateley Station. There was no change on Wednesday, but Lieut. Wadham and Lieut. Conran were both out flying for 35 mins. on their Blériots in spite of the very high wind. On Thursday, Major Brooke-Popham was out on the H. Farman 352 for 10 mins. Capt. Picton-Warlow on Avro 290 for 20 mins., on which Lieut. Birch also made a 20 mins. flight.

On Friday, Lieut. Birch on Avro 290 for 10 mins., after which Capt. Picton-Warlow took over the machine for 10 mins. Major Brooke-Popham on H. Farman 351 for two flights of 20 and 30 mins. Lieut. Cholmondeley, on H. Farman 352, flew to the Central Flying School, Upavon. Lieut. Stopford on H. Farman 295, with Lieut. Shekleton as passenger, flying for 1 hr. 20 mins., after which Lieut. Shekleton took over the machine for 10 mins. Capt. Fox on the 70 h.p. Blériot 221; after flying for a few minutes the engine gave out. In landing, the machine turned completely over and was smashed, but Capt. Fox escaped unhurt. On seeing Capt. Fox's machine descending, Lieut. Shekleton immediately got his H. Farman out and flew over to the scene with Mechanic Barrett as passenger. The bad weather prevented any flying on Saturday.



## The Russian Military Trials.

THE official awards in the Russian military trials give the first prize of 25,000 roubles to the Sikorsky biplane, with 80 h.p. Gnome motor, piloted by Aleknowitch, the second prize of 15,000 roubles to the Sikorsky monoplane, with 100 h.p. Gnome motor, piloted by Jankowsky, the third prize of 10,000 roubles to the Deperdussin, with 80 h.p. Gnome, piloted by Janoir, and the fourth prize of 5,000 roubles to the Morane-Saulnier, with 80 h.p. Gnome, piloted by Audemars. These were the only competitors of the 11 entrants to qualify. In the list of marks the Sikorsky biplane was first with 31.39 points, the Deperdussin second with 30.50 points, the Morane third with 29.09 points, and the Sikorsky monoplane last with 28.05 points. Foreign competitors had a handicap of a 10 per cent. reduction of marks, and that accounts for the Sikorsky monoplane obtaining the second prize.

## A Parachute for Aeroplanes.

ANOTHER parachute, designed as a safety device for aeroplane pilots, was demonstrated in Paris on the 29th ult. The parachute, which is the invention of MM. Fons Godail and St. Martin, was arranged on a monoplane fuselage, in the seat of which was a dummy to represent the pilot. The fuselage was then launched from the first platform of the Eiffel Tower, and the parachute opening out carried the dummy down gently, while the fuselage crashed to the ground. The parachute has ribs similar to an umbrella. It is stated that a Russian pilot, Davricheny, will shortly make practical experiments with the parachute from his biplane.

## CAPT. CHARLES TYRER, L.F.

ONE of the "familiar objects" at the past weekly meetings at Hendon has been the figure of Capt. Charles Tyrer, L.F., who has been one of those who have contributed no small amount of hard work and help in the organisation which has gone to make the meetings such unqualified successes. Habitues to Hendon will, we feel sure, regret to hear that Capt. Tyrer has left the aerodrome—we sincerely hope for the winter season only, for all those who have to do with the aerodrome and its



Capt. Charles Tyrer, L.F.

work will miss a real good-natured friend, and the Grahame-White Aviation Co. will miss a right-hand man.

We are not at liberty to say what Capt. Tyrer's new venture is, but, knowing him as we do, we were not surprised to hear that it is one after his own heart—hazardous. At all events, we think our readers will join us in wishing him every success in whatever he may undertake, and in hoping that next season will again see him once more smiling, "wagging" the pilots down, going up with every pilot on every machine, and planning "stunts," Hendon way.



# BRITISH NOTES OF THE WEEK.

## The First Lord at Farnborough.

CONTINUING his tour of inspection of the naval aircraft centres, Mr. Winston Churchill, First Lord of the Admiralty, was at Farnborough on Friday of last week. After consultations with Commander E. A. D. Masterman, who is in charge of the naval airships, Lieut. Col. F. H. Sykes, commanding the military wing, R.F.C., and Mr. Mervyn O'Gorman, C.B., Superintendent of the Royal Aircraft Factory, Mr. Churchill inspected the factory and the R.F.C. hangars. Late in the afternoon, the First Lord was taken for fifteen minute trips in the Beta and the Delta, Capt. C. M. Waterlow being the pilot each time.

## Hawker's Attempt for British Michelin Cup.

ON Friday last week, Hawker, on the Sopwith machine, made an attempt for the British Michelin cross-country prize over the Brooklands-Hendon course, but, after flying for three hours, and covering about 220 miles, he landed at Hendon as he was feeling unwell. He will, however, make another attempt to win the prize before the competition closes this week.

## Mr. Sydney Pickles getting along well.

WE are very glad to be able to announce that Mr. Sydney Pickles has made such splendid progress towards health, under the great care of Mr. Ivor Back, the well-known surgeon, and the careful nursing at the Hendon Hospital, that he has this week been moved to his mother's flat, 31, Cadogan Gardens, S.W. He is sufficiently recovered to be able now to welcome his friends at Cadogan Gardens, and in the meantime a call upon "Kensington 3696" will enable anyone to once again hear his cheery voice. Congratulations.

As to Mrs. Stocks, all will be delighted to learn that she also is steadily improving, and has been up daily for about a fortnight past. She is already taking keen interest in events, and has been constantly concerned in enquiring as to Mr. Pickles' state of health. There is every promise now of her complete and speedy convalescence.

## Flying at Shoreham.

MR. CECIL PASHLEY has had his engine down preparatory to his proposed trip to Lewes on Wednesday next. He has been putting up some flights locally, but the weather has been too inclement for much work. The Shoreham Flying School has been occupied in instructing pupils, but the "Chocolate Soldier" still stands in its shed.

## Lieut. Rainey at Shoreham.

LAST Saturday Lieut. Rainey, R.N., started from Eastchurch on an Avro biplane intending to fly to Shoreham. Capt. Ernest Bass and Mr. J. D. Cooper awaited the visitor at the aerodrome, but darkness approached and no sign of the machine was seen at Shoreham. It subsequently transpired that a landing had been

necessary owing to darkness and the machine was left in a field at Hove until Sunday, when Rainey flew her over to Shoreham. He went back to Eastchurch the following day, passing Brighton at 2,500 ft.

## Farnborough to Dover on a Farman.

ON a new Farman biplane, to replace the machine smashed at Shorncliffe recently, Lieut. Anderson, on Monday, made a fine flight from Farnborough to Dover.

## The Curtiss Flying Boat at Brighton.

THE Curtiss machine put up some good flights during last week. Capt. Ernest C. Bass, Lieut. Porte, R.N., and Mr. John D. Cooper have all been busy, and many more distinguished visitors have been down to inspect the latest Curtiss product. It is just a little slow in getting off the water, but that is a matter soon rectified by the installation of more power. It is understood that a 160 h.p. engine will replace the present one, and the machine's behaviour then will be watched with interest. On Tuesday, Mr. John D. Cooper and Lieut. Porte left for Bognor, where the Deperdussin control is to be fitted in place of the American shoulder-strap control. Messrs. White and Thomson are to execute the work, and it is probable that the machine will be back at Brighton to-day or to-morrow (Sunday) complete with the dual Deperdussin system. It will remain at Brighton for a day or two, and then proceed to Eastbourne, Dover, &c. Permanent hangar at Brighton.

## "Learning to Fly."

SUCH is the title of a very useful little booklet issued by Messrs. Vickers Ltd. with the object of assisting those who are thinking of taking up aviation. It sets forth very clearly the work which is entailed in the course of learning to fly an aeroplane, and there is also much useful advice which pupils would do well to ponder over. The photographs with which the booklet is illustrated serve to emphasise the exceptional facilities which the Vickers School has, enabling the pupil not only to learn to fly both monoplanes and biplanes if he so desires, but also to obtain useful knowledge on the construction of machines.

## A New Petrol Gauge.

FROM Mr. Eric H. Clift we have received a few particulars of a petrol gauge which he has designed. It has a dial face which can be calibrated in gallons according to the tank it has to work in conjunction with. We understand that there is no float or any moving mechanical connection between tank and gauge and that the accuracy of the reading can be tested at any time whilst in actual flight. It weighs about 1 lb. and can be fitted in a few minutes. It may be placed in any convenient position and at any distance from the tank.



Some snaps from M. Salmet's Bleriot at Scarborough from about 2,000 ft. up, taken by Mr. A. J. A. Wallace Barr recently. The centre photograph and the left show the Grand Hotel and foreshore from different points, and on the right is seen the railway station.

# ARMCHAIR REFLECTIONS.

By THE DREAMER.

## My Friend, Cynicus.

A LITTLE while ago, when I broke out into verse in this page, I promised not to offend again for quite a long time, and I had meant to keep my word. There is such a thing as waiting too long, however.

I am always going to do such a lot of things when I get time, but I have got such a lot of things to do that I do not get time to do them.

If you take our sister-journal, the *Auto*.—and I cannot conceive that you don't—you will have read "The Passing Show" every week.

My friend, Cynicus, is a genial sort of chap, who has travelled "some," and got "wide-ho," and ready to "freeze" on to the first thing that will provide "copy."

There is a printed slip hanging over our advertisement manager's desk, which sets forth that—

"The man wot whispers down a well  
About the goods he has to sell,  
Won't glean the blinking golden dollars  
Like him wot climbs a tree, and hollers."

Now, I saw that slip long before he did—in fact, I helped to pin it up; and I had made up my mind to make use of it some day in my "Reflections," and only kept off it because I had promised not to do it again for some time. But, as usual, he got there first, which I think is real mean. Not content with this, he fills up half his page with verses which he admits are "transplanted," and excuses himself by saying that they fill up a lot of space and "helps me no end."

I know verses fill a lot of space, and was only waiting long enough for my Editor to have forgotten the last lot before trying him with some more; and now, just when I think I might perhaps chance it, along comes Cynicus and "jumps the claim."

I have written the following verses for three reasons—first to fill space, secondly as a direct challenge to Cynicus to produce anything worse—either copied or original, and thirdly to let off steam. Now, hold tight!

If he's flying on a Biplane, and he's wobbling about  
As though he didn't know which way to go;  
In a kind of Ragtime-Tango-Bunnyhugging sort of way,  
And you plainly see he's putting up a "show":  
If he crouches like a jockey, with his head stuck out afore,  
If you think he's trying hard to join the "lates,"  
If you want to "have a bit on" with your friend who's standing by,  
Just bet him five to one its Richard Gates.  
If he comes out with a Caudron—the one that's painted white,  
And starts her up and sails away on high;  
If he doesn't "stunt" round pylones, but keeps on climbing up  
Until he's just a mere speck in the sky:  
If he stays up there for half-an-hour, an hour, or even two,  
And, returning, shows nonchalance almost wooden;  
If he's got a smile like Hawker's (and your friend has got the cash),  
Try and "touch him down" at five to three, it's Goodden.  
If he's flying on a Mono, with the wing-tips on the slant,  
And he tries to touch the top of all the trees;  
If he does a sort of waltz-cotillion-schottische round the sheds,  
Which makes you feel you're weak about the knees:  
If he makes a dive straight at you, and then soars away o'erhead,  
Until a drop of Hennessy's you must have,  
And you want to make the price of it (again out of your friend),  
You can "take it on" at evens that it's Gustav.

## Daucourt's Flight to Cairo.

STARTING from Augsburg on the 29th ult., Daucourt, with his companion Roux, completed another stage of his journey from Paris to Cairo by flying the 30 kiloms. to Munich. A smashed chassis which followed a heavy landing entailed a day's rest, and on the 31st a flight of 375 kiloms. took Daucourt to Vienna, his passenger

If he's flying on a Blériot it's rather hard to tell,  
Because there are so many knocking round;  
But if he does the "daisy-cutting-steeplechasing" act—  
A sort of "ducks and drakes" across the ground:  
If he goes just where you guess he won't, and won't just where you think  
(If you haven't done your friend for every penny),  
If he whizzes round about your ears just like a jumpy bat,  
You can "make a bit," at odds on, that it's Benny.

There you are, Mr. Cynicus. If your fertile brain can produce anything worse than that, I will hand you the biscuit.

## The 1913 Season.

Now that the evenings are beginning to get chilly, one can stay indoors and think over past events—which is cheaper than buying a new overcoat. I suppose another few weeks will see the end of the fixed racing programmes at Hendon and Brooklands, although I believe it is intended to give exhibition flights throughout the winter. There is not much doubt, judging from the interest taken in the races held in the past, that this is a sport that has come to stay. There has been some most remarkable finishes at Hendon, and I should like to congratulate Mr. Geo. Reynolds on the wonderful way he has got the hang of a most difficult undertaking. Handicapping aeroplanes is not so easy as handicapping motor cars. Weather conditions make all the difference between a fast and a slow machine. In a big wind, a slow biplane may have to be given nearly twice the start it would receive from a fast monoplane on a still day; and with so many things to take into consideration, friend Reynolds has shown himself capable of gripping new conditions, with the same masterly hand that he brought into use when dealing with motors, of which he is a past-master. There have been several dead-heats, and in nearly all races there have been tight finishes. The fact that so many machines came in within a few seconds in the Aerial Derby (and that, don't forget, over a course of 95 miles), that it was a work of art to get one out of the way to make room for the next, is something to be proud of.

I should not be at all surprised to find, next year, that the public will take the same interest in aeroplane-racing that they now do in horse-racing, and that we shall find the "bookie" shouting the odds from his corner at all meetings. I would almost venture to think that we might even see racing-colours brought into play, and that we shall read on our race-cards—"B. C. Hucks. Blériot monoplane. Pink jacket with blue sleeves, and yellow cap." It would be rather difficult to see the colours, perhaps, when the machine is in the air, but no doubt something could be done in the way of having the colours of the owner painted on the rudder or elsewhere. In any case, there is not much doubt that next year will see some exciting racing, and where there is excitement, produced by genuine competition, there the public will go. Let us hope that aeroplane racing will ever be kept free from anything that should raise the slightest doubt as to its genuineness.

making the journey by train. Sunday saw both voyagers arrive at Budapest on the Borel machine, while after being delayed for some hours by fog further progress was made the next day to Arad. On Tuesday, Daucourt flew unaccompanied the 300 kiloms. to Craiova in 2½ hours, the trip including the crossing of the Carpathian mountains.



## CATASTROPHIC INSTABILITY IN AEROPLANES.\*

By F. W. LANCHESTER, M.Inst.C.E.

THE object of the present paper is to call attention to and give a brief account of a form of instability that has up till the present time been virtually ignored. In the author's "Aerial Flight" vol. i., page 277, the following note will be found:—

"If, secondly, we suppose that the leading edge has too much 'dip' the want of conformity is in the opposite direction, and the surface of discontinuity springs from beneath the leading edge as depicted in Fig. 2 (in contrast to Fig. 1); the result of this is destructive to the whole peripteral system of flow, for the moment the pressure region commences to occupy the upper surface of the aerofoil a condition of instability arises, and a new system of flow is inaugurated which produces a downward instead of an upward reaction. This is a fact demonstrated experimentally; a model in which the adjustment has been carried to its limits will behave in a most capricious manner, sometimes gliding perfectly and at others dropping suddenly in the midst of a flight like a bird when shot."

So far as the author is aware the above is the only previous mention of the type of instability discussed in the present paper.

According to the suggestion contained in the quotation given, there should be a point when the attitude of an aerofoil is progressively changed, at which a sudden change in the direction of pressure takes place, a reversal, in fact, of the "lift" represented by a sudden change of sign—from positive to negative; with probably a region of ambiguity where two possible systems of flow exist.†

A large number of forms of aerofoil have been tested at positive and negative angles by many observers, including a comprehensive series of tests by the National Physical Laboratory, and (so far as the author is aware) no such sudden reversal or region of peripteral instability has shown itself; the curves in every case appear to pass without discontinuity from the positive to the negative region as the inclination of the aerofoil is changed. A few typical examples are given in Fig. 5. It will be noted that the point of zero reaction is not usually that of zero angle; this is a point of no importance, it arises from the purely arbitrary habit of measuring the angle of attack from the chord of the section as datum.‡

It is evident from the above that although the fact of catastrophic instability, based as it is on actual observation, cannot be disputed, the explanation given in the author's book as above quoted requires reconsideration. It is yet possible that forms of aerofoil will be found that will show discontinuity in the character of their pressure curve; but in absence of positive evidence, nothing of the kind can with fairness be assumed.

In the first instance we will revert to the study of the simplest of all gliding models—the ballasted aeroplane. This consists merely of a rectangular plate of mica,§ of aspect ratio = 4, ballasted by means of fishing-shot|| at its forward edge, the centre of gravity being about one-quarter of its width from the leading edge. The author has frequently demonstrated these gliders in flight before an audience, and though it is usually quite easy, at times they have a most provoking way of starting their flight on an inverted path. In connection with the present subject it is the relation of this inverted flight path to the normal flight path that we shall investigate.

At the outset there is one feature of the ballasted plane to which attention may be drawn—namely, its symmetry; briefly it has no "right side up." Now we know that if any aerodone or gliding model be launched upside down at or about its ordinary flight velocity, its flight path is entirely modified in character; referring to Fig. 6

(Fig. 42 of the author's "Aerial Flight," vol. ii), a number of plottings of the theoretical flight path are given, and by a comparison of curves 2 and 11, or 3 and 10, for instance, we can appreciate the effect of the inversion of the glider at the instant of launching (at the vertical datum line these pairs of curves have the same velocity). Similarly, we might suppose an aeroplane in stable flight on a path, such as 2 in the diagram, suddenly turned over at the vertical datum line, so that its flight path becomes that numbered 11, which is past that which by convention we are accustomed to regard as the limit of stability, the machine is in the act of looping the loop. It is well that in actuality a flying-machine is not liable to be thus suddenly overthrown.

In the case of the simple ballasted aeroplane, however, we do not require to suppose the model turned over. It has no "upside down," and is in effect inverted by any cause that gives rise to a reversal of the pressure system; this may easily take place owing to a gust or eddy, or, as the author has frequently experienced to his discomfort, by a slight want of dexterity in launching.

In Fig. 7 we take O to be the point of launching, the two alternative flight paths, the straight glide and the tumbler curve, are shown by the two lines OA and OB. In OC we have the ordinary parabolic trajectory of a heavy body having the same velocity; it represents, in the equivalent case of an actual machine, the path that would be taken by the aeronaut or other heavy body not strapped in or secured to the machine. The pressure reaction in the case of the path OA being upward, the weight of the aeroplane is sustained. In the case of path OB, the pressure reaction being downward, the curvature of the natural trajectory is exaggerated in the resulting flight path. In Fig. 8 the alternative flight paths are represented more nearly as they would in practice appear; the horizontal straight line of Fig. 5 becomes inclined at approximately 1/7, as representing the coefficient of resistance or gliding angle, and the tumbler curve rapidly degenerates into an oscillatory flight path, owing to damping, which, in the case of the ballasted plane, is considerable. The diagram roughly represents the flight path in its true proportion to the figure of a man depicted for mica planes such as used for indoor demonstration.\*

It is evident from the foregoing that the ballasted plane, stable as it is in most respects, is an implement of flight totally unsuitable for aeronautical purposes; it is, using the title of the present paper, "catastrophically unstable." Any serious eddy comprising a sudden down draught, or even the reaction following an up draught, might at any time, without the least warning, reverse the peripteral-pressure region and invert the flight path, with almost certain disaster to the machine and its occupants. But it is not the ballasted plane alone that shows this form of instability; the author has frequently seen a model, whose behaviour in the ordinary way is irreproachable, suddenly, when launched in the open air, take it into its head to fly upside down. In one particular case this frequently took place when the model reached the highest point in a tumbler curve flight otherwise at the highest point when looping the loop. At this instant the flight path curvature is greatest, and the tail length tends to modify the attitude of the aerofoil in such sense that catastrophic instability will be shown. In this case subsequent flight followed an undulating path at considerably above the normal speed with the model in an inverted position.† There is, in fact, no reason why we should expect the phenomenon of catastrophic instability to be confined to any one form or type of flight model, though there are certain types that both theoretically and experimentally appear to be immune. Up to a certain point the capacity of a model or machine to fly upside down may be taken as *prima facie* evidence of its being catastrophically unstable, but it is necessary to draw a distinction between models and actual machines, inasmuch as the constants of an actual machine may be altered at the will of the pilot, and so when flown upside down it may not, in the sense of the present paragraph be the same machine as when in normal flight.‡ The change contemplated as actually made by the pilot is the variation of the inclination of the tail-plane or elevator of his machine. The essential point here is whether with a single fixed setting of the tail-plane the machine is capable of being flown both the right way up and upside down. It is the setting of the tail-plane corresponding to high speed that will tend to catastrophic instability—i.e., the down-trend position. Thus it is that when an aeronaut acts to initiate a *vol plané*, or to set his machine for a very rapid descent, especially where high velocity is intended, that the greatest danger from catastrophic instability is to be feared. It

\* Read before the British Association at Birmingham, September, 1913.

† Such unstable regions in the attitude of an aeroplane actually exist in certain cases. Recent experiments with a square plane in which, on the one hand, the angle is gradually increased from zero and, on the other hand, gradually decreased from 90°, show that two separate curves in reality exist, and that for over certain range of angle (between  $\alpha_1$  and  $\alpha_2$  in Fig. 3) a condition of instability exists, and the pressure reaction is liable to sudden change as the conditions pass from one curve to the other. It is evident that such a condition of things implies that there are two distinct systems of flow; it is probable that in this particular case the two systems are respectively characterised by vortices transverse to the line of flight for small angles, and vortices parallel to the ends of the plane for the larger angles; the said vortices occupy the dead-water region. Between the limits of angle,  $\alpha_1$  and  $\alpha_2$ , either system may persist. The idea tacitly implied in the passage cited from the author's "Aerial Flight" is that a similar condition of instability exists about the region when the reaction changes from positive to negative, as shown diagrammatically in Fig. 4. This view is negated by the experimental evidence that up to the present has been accumulated.

‡ It is easy to see that the measurement of angles from the chord of section is an arbitrary measurement, inasmuch as an extension of the aerofoil surface, forward or backward, to follow accurately the streamline flow will give an entirely new angle as measured to the chord without involving an essential alteration to the aerofoil from an aerodynamic standpoint.

§ Mica is by far the best material available for the purpose, being as stiff as tempered steel, and but one-third the weight.

|| Lead shot split half-way through.

\* A mica plate about 2 in. by 8 in.; weight with ballast about 6 grammes.

† Compare "Aerial Flight," vol. ii, section 175.

‡ In the recent experiments of M. Pegoud, for example, there is no reason to suppose that the tail-setting was the same in the inverted position as in the normal flight.

seems that there should be some check or limit prescribed to the turning downward of the tail members.

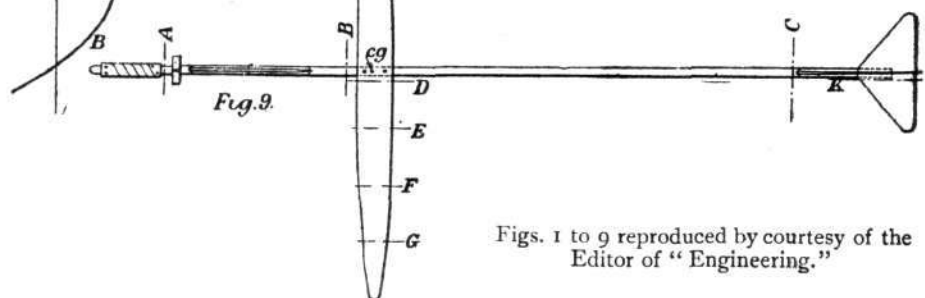
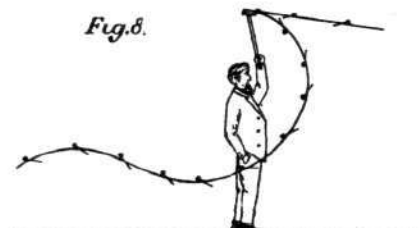
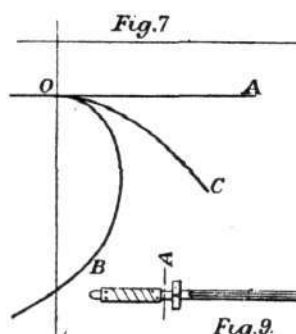
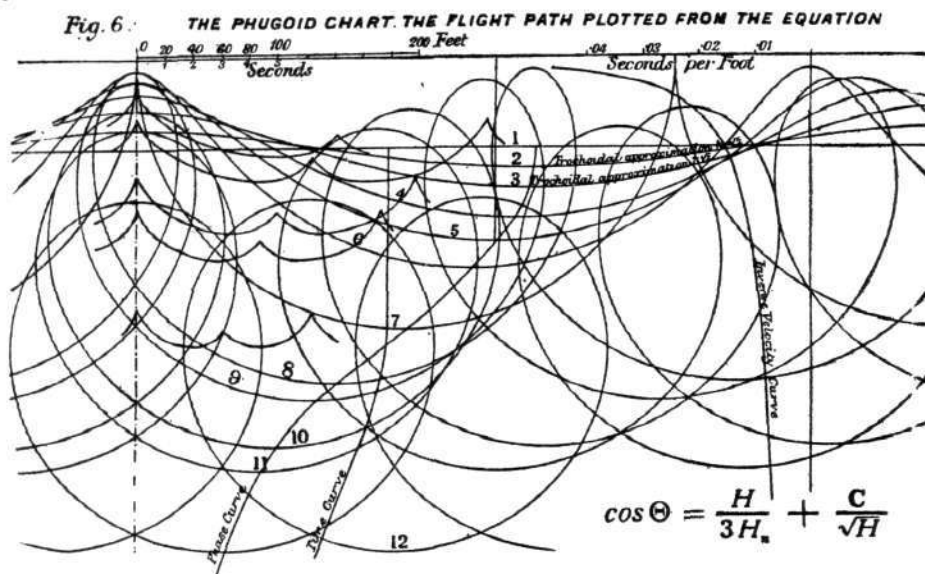
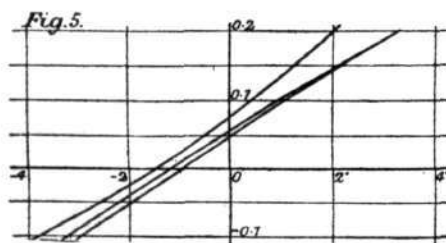
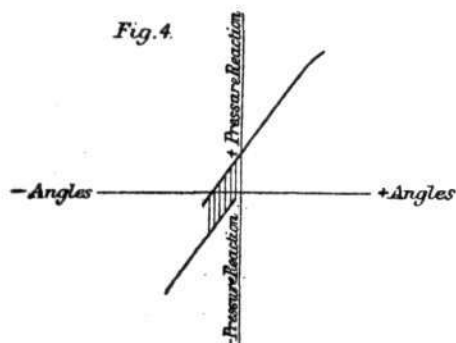
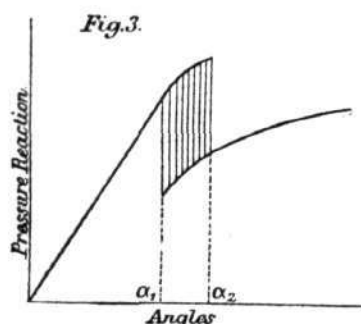
In the case of the simple ballasted plane the natural velocity in its two alternative positions is essentially the same, but in the case of the aerofoil of pterygoid form the flight velocity of a model in the inverted position is commonly higher than when the right way up; in the latter, consequently, if reversal should take place, the downfall is greater. A rough estimate indicates that in the case of a flying-machine of ordinary proportions and flight speed, the extent of the drop in the event of reversal, if not corrected by the pilot, might amount to some 600 ft. or 700 ft.

Having discussed in a general way the character of the type of instability under consideration, we will proceed to examine more closely the conditions and controlling factors on which it depends. We may assume that the result brought out as the general result of experiment to date, that the absence of any discontinuity in the pressure reaction holds good in all cases, and that the phenomenon under

5. A flight model or machine designed with the mass centre forward of the centre of pressure of its aerofoil, so that the tail-plane carries a negative-pressure reaction, will be catastrophically stable, for its change of attitude consequent on the reversal of the pressure reaction is the reverse to that laid down in (2). If it is capable of flight one way up, it cannot possibly be capable of flight when reversed.

6. A flight model or machine designed with the mass centre aft of the centre of pressure of the aerofoil, so that the tail-plane carries positive-pressure reaction, behaves in accordance with condition (2) and may be catastrophically unstable.

7. The conditions that define the limit of catastrophic stability are closely akin to those that define directional stability in the vertical plane. If both aerofoil and tail-plane follow the law that reaction varies as angle, and if the influence of centre-of-pressure changes be ignored, and if the tail-plane be arranged clear of the wake stream, the limiting conditions may be regarded as identical, and it would



Figs. 1 to 9 reproduced by courtesy of the Editor of "Engineering."

discussion therefore is not due intrinsically to any properties or individuality of the aerofoil. The following may consequently be laid down:—

1. There must be a change of attitude of the aerofoil simultaneously and corresponding to the inversion of its flight path.

2. The change of attitude must take place in a sense that will cause the after or tail portion to move towards the pressure side—that is to say, when the pressure side of the aerofoil changes, the tail must swing in the corresponding direction. Conditions 1 and 2 are illustrated by the behaviour of the ballasted plane in Fig. 8.

3. The model being by hypothesis rigid, the change in the attitude of the tail or directive member will be of like sense and equal in degree (equal angle) to that of the aerofoil itself.

4. A flight model or machine whose mass centre coincides approximately with the centre of pressure of its aerofoil, fitted with a tail-plane of ample area, will be catastrophically stable (example, author's 1894 model, Fig. 9), for the directive member (the tail-plane), carrying neither positive nor negative load, cannot change its attitude as necessitated by the reversal of the pressure reaction.

be virtually impossible to design a model to be directionally stable and show catastrophic instability.

8. A model or machine whose tail plane or member is loaded up to a point approaching the limit of directional stability (in a vertical plane) may be catastrophically unstable as the result of one or all of the following causes:—

(a) The aspect ratio of the tail-plane being relatively low when compared to the main aerofoil.\*

(b) The movements of the centres of pressure of both the main

\* The importance of the relative aspect ratio of the aerofoil and tail member is due largely to the different character of the pressure law and the changing values of the constants where the aspect ratio differs in any considerable degree. It is established that for aeroplanes of high aspect ratio the reaction for small angles is approximately directly as the angle, whereas for aeroplanes of extremely low aspect ratio it more closely follows the  $\sin^2$  law of Newton (see "Aerial Flight," vol. i, sections 150 and 151). It is consequently possible by designing a tail like that of a pheasant, of low aspect ratio, to reach a condition of catastrophic instability without destroying the directional stability in the vertical plane. A good illustration of the effect of aspect ratio in the present connection is given by the author's experiments of a falling "T," as shown in his lectures before the Royal Society of Arts and elsewhere.



aerofoil and the tail-plane with changes of angle (owing to these movements contributing to the directional stability without contributing to the catastrophic stability, as in the ballasted plane).

(c) The influence of the "wash," or downward wake stream of the main aerofoil, by its influence on the flight attitude.

From the point of view of the present paper one is inclined to direct a certain amount of criticism to some of the features commonly met with in actual flying-machines, though it might be rash positively to assert that catastrophic instability has as yet been the cause of disaster.\* In the author's opinion it would be wise to avoid the deliberate loading of the tail member, its function should be purely directive. The author has always found that in practice a tail carrying no load or even slight negative load is preferable in model experiments. It would also appear to be desirable to pay attention to the tail member, giving it an aspect ratio comparably equal to the main aerofoil.

With due attention to these two points, and with the reasonable curtailment of the fore-and-aft dimension of the aerofoil, giving it a good pterygoid section and aspect ratio (abandoning all idea of obtaining stability from the movement of the centres of pressure on the aerofoil and tail members in the manner of the ballasted plane), and with a "stop" or limit to the elevator or tail control, there can be very little danger in the future of any disaster from the cause under discussion. Experiments also might be made with scale models in a wind channel to determine definitely the conditions as to upside-down flight, to prescribe limits of safe-load distribution and safe tail or elevator angles of adjustment, for any given model.

Flexibility of the aerofoil has an important bearing on the catastrophic stability (classifying such flexibility as weather-vane flexibility (as in a bird's wing) and drumskin flexibility; it may be said in brief that weather-vane stability in the aerofoil tends to stability, and drum-skin flexibility to instability.

Catastrophic stability is not definitely related to the other well-known kinds of stability involved in the problem of flight; in order to realise more completely the true position it is of interest to digress and review the different forms of instability known and comprised in the ordinary treatment (mathematical or otherwise) of the problem.

There is, firstly, the whole question of longitudinal stability, involving (a) the stability of the machine relatively to its transient flight path—namely, as in the stability of an arrow, and (b) the stability of the flight path itself in relation to the direction of gravity, as dealt with by the author in his "Phugoid Theory." Both the above (a) and (b) involve complex questions of oscillations about the position of stable equilibrium and the damping of such oscillations as

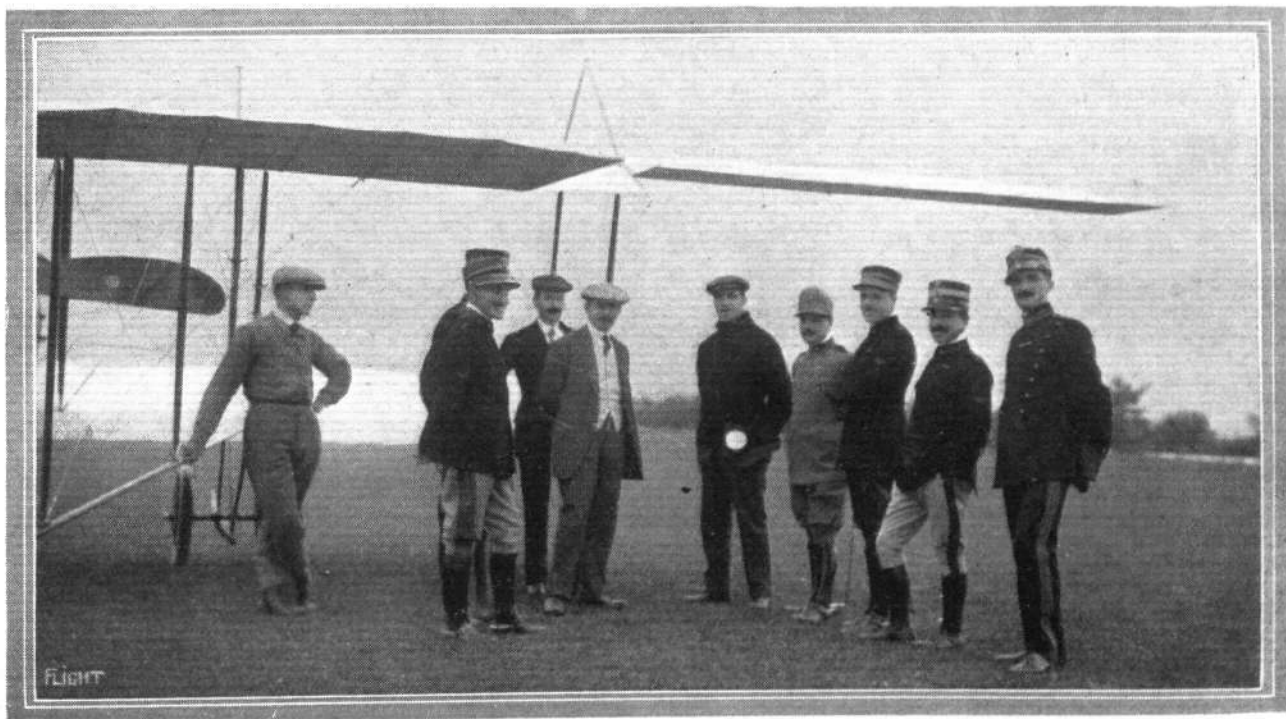
\* The recent accident to Major Merrick, which unfortunately cost him his life, and which took place some few weeks after the reading of the paper, appears to have been clearly due to catastrophic instability.

may be set up by disturbing causes. Secondly, there is lateral stability (superficially analogous to the stability of a ship), in which, also, the problem is complicated by considerations of oscillatory motion; thirdly, there is directional stability, concerned mainly with rotary motion about a vertical axis; and, fourthly, there is a kind of stability known as spiral or rotative stability concerned with the interaction of motions separately considered under the last two headings. All these kinds of stability have been made the subject of previous study, both by the author's method and by the mathematical method of Dr. Bryan; but the kind of instability dealt with in the present paper is entirely external to the conditions on which the two lines of treatment mentioned are based; it is presumably owing to this fact that the possibility of what in the present paper is termed "catastrophic instability" has been so widely ignored.

In the case of a machine or model that will fly either way up there are two entirely different sets of constants, each set giving equations satisfying the conditions of stability, but there is no necessity for relationship between the two; we may, in fact, look upon the model in its two positions as two different models; in the case of the ballasted plane and other symmetrical forms the two equivalent models may be regarded as duplicate.

Although the existing theories of flight enable us to deal individually with either of the two systems of flight, of which a given model is capable, they take no account of the possibility of a translation from the one condition to the other; anything of the kind is tacitly ignored.

As a concluding illustration of the importance of the present study we may revert to the case of the ballasted plane and compare the magnitude of single gust required to destroy the longitudinal stability with that required to exceed the limit of catastrophic stability. Referring to the chart (Fig. 6) we know that the limit of stability for longitudinal oscillation is reached in the case of the semicircular path—that is to say,  $\sqrt{3}$  times the natural velocity is the limit with the flight path horizontal. In other words, a head gust  $\sqrt{3} - 1$ , or say, = 0.7 of the velocity of flight is required to bring about risk of disaster. Against this, in order to induce catastrophic instability, we only require a vertical gust well in excess of the vertical component of the angle of incidence, or, say, one-sixth of the velocity of flight, so that, in the case of the ballasted plane, in order to change entirely the system of flight and induce catastrophic instability, it only requires a gust of about a quarter the magnitude that it requires to reach the limit of longitudinal stability. It is evident that where there are two systems of flight—that is to say, where a model will fly either way up—in no case can we afford to ignore the considerations raised by the present paper, and, in short any such model must be regarded with the gravest suspicion by the aeronautical designer.



A group of Italian officers at Pordenone, with M. Chevillard and Mr. Lawrence Santoni, Managing Director of the "Savoia" Co., who are the Farman licensees in Italy, after the reception of the Farman machines for the Government.

# FOREIGN AVIATION NEWS.

## The End of the Pommery Cup Contest.

UP to the last day of October no one had beaten Brindejonc des Moulinais's record for the Pommery Cup, and it appeared certain that he would be the winner of the half-yearly competition, and also, by virtue of that fact, become the owner of the cup. There is just a little uncertainty, however, as on Friday Gilbert made a splendid flight from Villacoublay to Puetnitz by Damgarten, in Pomerania. According to one estimate the distance is 1,050 kiloms., but it appears to be 950 kiloms.; the time for the journey was 5 hrs. 14 mins. There is a clause in the Pommery Cup conditions, which provides that, should a competitor succeed in covering 1,000 kiloms. in less than five hours, this should entitle him to the cup, irrespective of any long-distance flight which would in the ordinary course secure the prize. It is understood that Gilbert claims to have fulfilled this condition, and the matter is being investigated. On Sunday, Gilbert started to fly to Berlin. He reached Stettin, but at Britz he had a smash, mainly through being unable to see through the mist. He escaped unhurt. Gilbert used his Deperdussin monocoque, with 160 h.p. Rhone motor and Chauviere propeller.

The Pommery prize of 50,000 francs was offered in 1911, on the condition that it was to be competed for in half-yearly periods for three years, the winners of the first five contests to each receive 7,500 francs in cash and a miniature of the cup, while the final winner was to have the Pommery Cup in addition to the remaining cash. It was stipulated that to qualify flights must be made in a straight line, in one day, and at a speed of not less than 50 kiloms. an hour. The first contest ended on April 30th, 1911, and was won by Jules Vedrines, by his flight on a Morane-Borel from Paris to Poitiers, 336 kiloms. On a similar machine he won the second section, flying from Paris to Angoulême, 400 kiloms. In the first half of 1912, Bedel, on a Morane-Borel, was the winner, going from Villacoublay to Biarritz, 645.281 kiloms., while Daucourt, on a Borel, won the second prize in 1912 with his trip from Valenciennes to Biarritz, 852 kiloms. Both the 1913 sections have produced some very noteworthy flights, the first section being won by Guillaux, on his Clement-Bayard, with a flight from Biarritz to Kollum, 1,253 kiloms., while the flight which won for Brindejonc the cup and closed the competition was made on a Morane-Saulnier monoplane from Villacoublay to Warsaw, 1,389 kiloms. Apart from these winning performances it may be interesting to recall that other flights of over 1,000 kiloms. made in connection with the competition this year were by Gilbert (Morane), Paris to Medina, 1,050 kiloms.; Gilbert (Morane), Paris to Caceres, 1,300 kiloms.; Guillaux (Clement-Bayard) Paris to Bermillo, 1,160 kiloms.; Guillaux (Clement-Bayard), Biarritz to Brockel, 1,300 kiloms.; Seguin (H. Farman), Biarritz to Bremen, 1,350 kiloms.; Janoir (Deperdussin), Etampes to Berlin, 1,000 kiloms.; Letort (Morane), Paris to Dantzig, 1,350 kiloms.

Another Pommery prize has been offered to be competed for under similar conditions, except that the competitors will be allowed two days in which to complete their flight.

## A German Passenger Record.

STARTING from Johannisthal on Wednesday of last week, with the intention of flying into Russia, Felix Laitsch, with a passenger, on a Schneider biplane eventually landed at Königsberg. He had flown over the Russian frontier, but on account of the mist deemed it prudent to return to German territory. He was in the air 9½ hrs., which is claimed as the world's duration record for a passenger flight.

## E. Stoeffler's Flight to Paris.

HAVING landed at Cologne on Monday evening of last week, in his flight from Berlin to Paris, Ernest Stoeffler stayed there for the night. The next day he went on to Laon, being brought down there by his petrol supply giving out. Having had their papers examined and paid the customs duties, Stoeffler, with his passenger Seekatz, made another start for Paris on Wednesday week at 10 a.m. They landed at Montigny, near Fontainebleau to make enquiry and eventually reached Villacoublay at 5.30 p.m. On Friday Stoeffler and his companion left Villacoublay in the darkness at 2 a.m., with the intention of flying into Russia. When near Versailles, however, the machine ran into a bank of fog and failing to clear the tops of some trees, it crashed down into the park. The machine was smashed, of course, but fortunately the pilot and passenger had a miraculous escape, sustaining nothing worse than bruises. The machine was an Albatross biplane with 100 h.p. Mercedes engine.

## Helen Still Progressing.

CONTRARY to the first announcement, Helen decided to continue his record for the International Michelin Cup after his stop on Tuesday week, and he was able to complete the fifth lap. The next morning he started off as usual and continued to do five rounds of the Etampes-Cercottes course regularly day by day. Up to

Sunday night the Nieuport-Gnome machine had completed a total distance of 6,396 kiloms.

## A Four-seated Voisin on Trial.

AT Issy, on October 28th, Corpl. Mahieu was testing the new four-seated Voisin biplane, which is fitted with a 200 h.p. 8-cyl. V-type Clerget-Blin motor. With four persons on board, the machine made a satisfactory trial flight in a high wind.

## Rheims to Crotoy on Bathiats.

ROBINET and Chausse, both on Bathiat machines set out to fly from Rheims to Crotoy on the 29th ult. They landed at Laon, and arrived at Crotoy within a few minutes of each other.

## Legagneux Joins the Nieuport Firm.

IT was announced last week that Legagneux had been engaged to fly Nieuport machines.

## A Promising Farman Pupil.

LIEUT. LUGRIN, of the Swiss Army, who is taking a course of instruction at the Farman School at Etampes, on the 30th ult., made a flight of an hour-and-a-half at a great height, and in a very strong wind.

## Mdlle. Marvingt Flying Again.

THERE appears to be promise of a revival of the old-time rivalry between Mme. de Laroche and Mdlle. Marvingt for the Coupe Femina. The former is practising at Mourmelon on a Farman, while the latter is flying a monoplane at Rheims. On the 28th ult., Mdlle. Marvingt made a non-stop trip from Rheims to Dizy-le-Gros and back.

## Another Entrant for the Coupe Femina.

STILL further excitement is promised in the competition for the Femina Cup, as Mme. Pallier has entered. She will make her attempt at Chalons Camp on an Astra-Nieuport biplane.

## Slow Flying by Guillaux.

AT Crotoy, on the 28th ult., Guillaux made a fine flight on a Caudron-Gnome, getting up to a height of 2,500 ft. The wind was so strong that after flying against it for half-an-hour, Guillaux had only covered a distance of 5 kiloms.

## Prohibited Areas in France.

IT seems strange at first sight to hear of French aviators being arrested in France, but the case of Vedrines has been quickly followed by another. On Saturday, Galtier set out from Crotoy to fly to Bremen, but after passing over Gravelines he was in trouble with the sparking plugs of his engine, and eventually had to land at Dunkerque. As that, however, is a prohibited area, the pilot was detained, and his machine taken charge of by the police until the matter had been investigated.

## Good Flying in Company.

TWO monoplanes piloted by Sergts. Faure and Genevois, on Saturday, flew in company from Avor Camp to Autun, a distance of 150 kiloms., in 1 hr. 20 mins. Later in the day the two machines continued their journey to Chalons-sur-Saone.

## Military Brevets in France.

TWO more changes will be made in the tests for the French superior or military *brevet* from January 1st next. The altitude flight will be of an hour's duration, and will have to be made at a height of at least 1,000 metres and not more than 1,200 metres. In order to qualify a pilot will be required to make all the qualifying tests within a period of six months.

## Hiring Aeroplanes by the Hour or Day.

AN indication of what may in the future become a regular business is seen in France, where several well known sportsmen have qualified as aeroplane pilots, and as they do not possess machines of their own they simply hire one for an hour or two whenever they feel so disposed. Perhaps the time is not far distant when aeroplane firms will regularly advertise that machines, like bicycles, may be hired by the hour or day.

## Pegoud at Dresden, Hanover, and Ghent.

CONTINUING his tour, Pegoud gave two demonstrations of his upside-down flying and looping the loop at Dresden on the 31st ult., before a crowd estimated at 250,000. On Saturday and Sunday similar performances were made at Hanover, while on Monday he was at Ghent.

## Fine Flying in Company.

LAST week an escadrille of five machines, piloted respectively by Lieuts. Pierra and Marlin, Sergts. Damberville and Chatelain, and Corpl. Irat, made a fine flight of 900 kiloms. in six stages. Starting from Verdun on Monday week, they flew to Mourmelon, and the next day went *via* Mezieres and Maubeuge to Douai. Wednesday saw the journey continued to Arras, Thursday *via* Amiens to Sissonne, Friday to Rheims, and on Saturday the five machines arrived in company at Verdun.



### German Long Distance Flying.

IN connection with the prize offered in Germany for the longest flight in 24 hours, Schueller, on the 31st Oct., covered a circuit from Leipzig to Halle sixteen times and then flew to Potsdam, Johannisthal and Posen, being brought down at the last place by a broken petrol pipe. The total distance covered was about 1,600 kiloms. There seems to be some uncertainty as to whether the flights for the prize should be made in a straight line, and if this is so Victor Stoeffler may lose the first prize. Up to the present the outstanding performances in the competition are:—Stoeffler, 2,150 kiloms.; Schlegel, 1,480 kiloms.; Kasper, 1,450 kiloms.; Thelen, 1,330 kiloms.; Stoeffler, 1,300 kiloms.; Lieut. Kastner, 1,250 kiloms.; Friedrich, 1,120 kiloms.; Stiefvater, 1,100 kiloms.; Wieting, 1,020 kiloms.; Lieut. Geyer, 1,015 kiloms.

### A Chauvière-Integral Success at Ghent.

THE merit of the exhibit of Chauvière-Integral propeller at Ghent Exhibition has been recognised by the award of a Grand Prix.

### Friedrich Does Cork-screw Twist.

FROM Berlin it is announced that, following Pegoud's visit to Berlin, Friedrich, who recently flew to London *via* Paris on his Etlich, succeeded twice in doing the cork-screw twist, on one occasion being accompanied by a passenger.

### 1,300 Kilom. Flight in Germany.

LEAVING Cologne at 12.30 a.m. on the 26th ult., Lieuts. Kastner and Boehmer flew to Posen, where they arrived at 5 p.m., having made a stop on the way at Berlin. The distance flown was about 1,300 kiloms.

### An Aerodrome for Dresden.

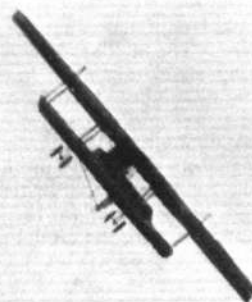
IN the presence of the King of Saxony and other Royalties, as well as Government and municipal officials, an aerodrome was inaugurated at Dresden on Sunday week. About 100,000 persons attended the function and saw the Zeppelin "Sachsen" cruise overhead for an hour, while demonstration flights were made by three monoplanes and four biplanes.

### Long Flight in Russia.

ON the 27th ult., Tkatcheff, a Russian military aviator, completed a 1,600 kilom. journey from Kieff to Ekaterinoslav, on a Nieuport-Gnome machine. His route from Kieff was *via* Vinnitza, Odessa, Kherson to Kertch, and then across the Kertch Gulf.

### Sikorsky's Ambitious Project.

AS soon as his "Grand" biplane is repaired, Sikorsky proposes to try and fly it, with thirteen or sixteen passengers on board, from St. Petersburg to Sebastopol, with stops at Moscow and Kharkoff. The distance of the proposed trip is about 3,000 kiloms.



FLIGHT

Chevillard, on his Farman, in the air at the Miraflore Racecourse, Turin, commencing one of his steep banks, being watched by the spectators below.

### Rome to Naples in Company.

FOUR Blériot monoplanes, piloted by Lieuts. Alvisi, Clerici, Picci, and Suglia, on October 18th, flew in company from Rome to Naples.

### Seven Aeroplanes over Rome.

IN connection with some manoeuvres, in which Rome was supposed to be besieged, on October 23rd, seven aeroplanes—four Blériots and three Henry Farmans, were seen flying over the city.



## AIRSHIP NEWS.

### The "Conte" Goes to Belfort.

THE French military dirigible "Conte" arrived at Belfort on the 31st ult., from Issy, the trip of 500 kiloms. having taken 6½ hrs. Nine persons were on board. The route followed was *via* Villearen, Normant, Nangis, Provins, Troyes, Lusigny, Chaumont, and Montigny-le-Roy.

### The New German Navy Zeppelin.

IT is understood that the two new Zeppelins, which are being built at Friedrichshafen for the German Navy, will be stationed at Cuxhaven, where two revolving sheds are being built. Naval airships will not in future be stationed at Johannisthal. In the meantime, the officers and men who were attached to the ill-fated "L1" and "L2" are attached to the "Sachsen" and the "Victoria Louise" in order to obtain practice in the handling of such big vessels.

### A Parseval in Trouble.

LEAVING Bitterfeld at 6.57 on Saturday morning, the Parseval "XVI" cruised to Hamburg, passing over the city at 11 a.m., and reaching Lubeck at noon. The airship was then steered in the direction of Koenigsberg, but at 5 p.m., when near Neastrelitz, the vessel ran into a violent wind storm, and the commander, in view of the danger, pulled the ripping cord and made a rapid descent.

### Regular Zeppelin Services in Germany.

PARTICULARS have been published of a project which the Hamburg-Amerika Line has in hand for the establishment of regular cruises between certain places in Germany. Eight stations are already in existence—at Potsdam, Hamburg, Dusseldorf, Frankfurt, Baden-Baden, Friedrichshafen, Gotha, and Leipzig, while others are being built at Emden, Bremen, Hanover, Brunswick, Dresden, Munich, and Stuttgart. It is also proposed to run a regular service to Copenhagen, and this may be followed by one between Berlin and London.



Watching Chevillard on the Miraflore Racecourse, Turin, during his extraordinary bankings on a Henry Farman. Note the difference in expression, from laughter to horror, on the faces of the watchers.



Edited by V. E. JOHNSON, M.A.

**The Problem of the Ornithopter. A Model Ornithopter.**

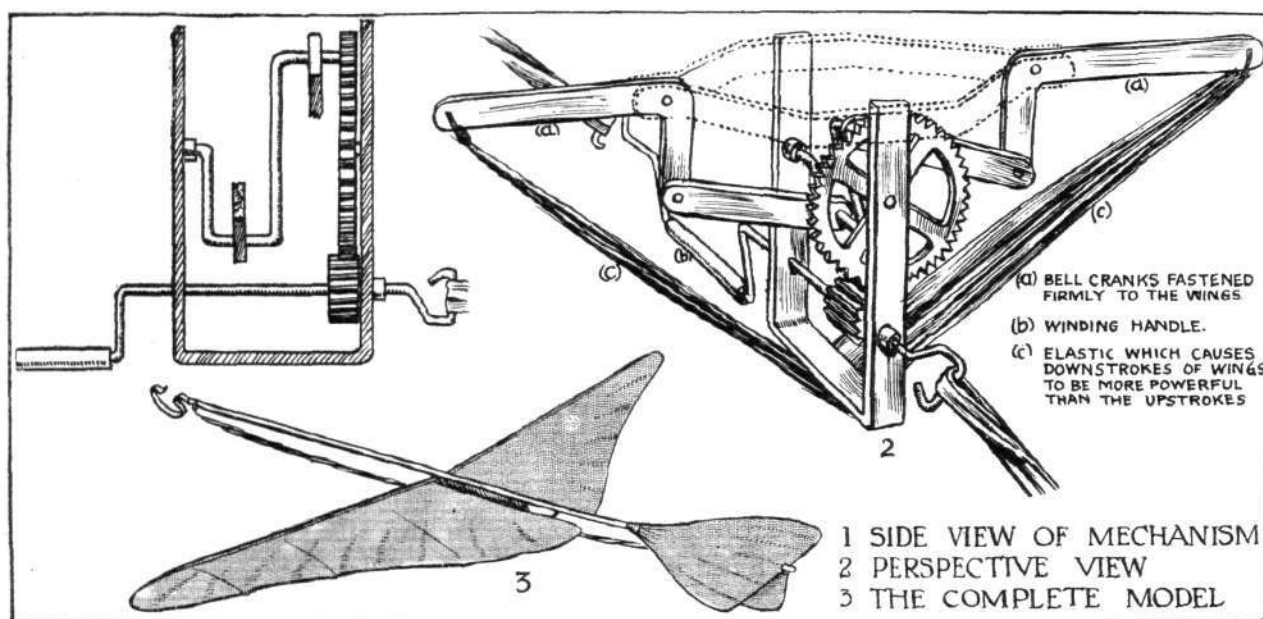
The ornithopter drawings which we give this week are taken from a French model which can be obtained commercially.

The drawings show the wing flapping mechanism quite clearly, and need no further explanation. The model is constructed of aluminium and steel wire. The motor rod being a piece of aluminium tubing with a steel spring shock absorber in front. The leading edges of the planes are aluminium tubing, and the ribs and rear edges steel wire, the wing has thus a (comparatively speaking) rigid leading and flexible trailing edge, for reasons stated in last week's issue. As most of the readers of FLIGHT are aware, French model aviation construction is far behind the British. The aluminium motor rod soon collapsed, and other minor breakages occurred, and but little success was obtained with the model as first purchased. A hollow spar (of greater length) was substituted for the aluminium

but little resemblance to a bird, but that has nothing to do with the matter. We want first of all a model which (from our past knowledge of aviation model work), appears most likely to fly. The machine is essentially designed as a flying-stick of the flapping wing type. When we have obtained some success with such a type, then we can proceed to elaborate. It is the crudest form of flapping flight, but I am quite sure of one thing, and that is that in the first instance success will not be obtained by attempting to build a model entirely on bird-like lines.

**Valvular Wings.**

It has often been asserted that the wings of birds are so constructed that the air on the down stroke cannot pass through the feathers, whereas on the up-stroke it can. If this were so the wing would obviously act as if it were fitted with valves. The chief and only evidence that we know of to support this theory is that whereas



A French ornithopter model.

tubing, and a few minor alterations were made, and in the end a flight of some 40 ft. was obtained hand launched. Unfortunately these experiments were made some time ago, and I can only remember some of the chief deductions I arrived at; they were that the gearing should be done away with, since it appeared to absorb at least 50 per cent. of the energy, that two pairs of wings should be used instead of one, and that the rubber springs for accelerating the down stroke were a great mechanical disadvantage and that some other means should be devised of obtaining the same result. All attempts without the use of such were, however, an absolute failure, and it appeared an absolute essential feature of successful ornithopter flight that something in the nature of a stroke-accelerator was absolutely necessary. The model was also tried with the rubber springs accelerating the up stroke, but with what result I cannot now remember, but I seem to have some kind of recollection that it was rather successful, although on the face of it, this appears to be a somewhat absurd conclusion.

I should strongly recommend anyone about to try any experiments with such models to proceed on the following lines: For the motor rod or backbone use a very light hollow spar some 3 ft. long, tapering, of course, towards both ends. This should be built up of two half  $\square$  shaped sections joined centrally and not one complete  $\square$  section with a piece along the top; it can be of either a square or oval section. Use no gear but two rubber motors, extending nearly the full length of the fuselage, employ two pairs of wings, one at each end of the motor rod. The length of the rubber motor will thus be the length of the motor rod minus about half the wing breadth. Balance with a horizontal and vertical fin (position alterable), placed somewhere between the wings, say about midway. Mount the model on wheels, say one in front and two behind, using featherweight wheels, and the lightest steel wire chassis that will support the weight of the model. Experiment with it on the smoothest surfaces obtainable. Such a model bears

it is quite easy to thrust one's finger through the wing from the upper side, it is quite a different matter to do this from the lower. In the case of bats, flying foxes, &c., it is self evident that no such theory can be applied. The natural curvature of the wing of a bird naturally renders it easier to move it upwards than downwards. A valvular wing containing a sufficient number of valves would tend to reduce, or even counterbalance any support during the up-stroke, and the bird would be compelled to rely solely on its momentum for the maintenance of its altitude during each up-stroke of the wing. Valvular wings have been a pet subject with aviation inventors of a certain type, as long as the writer can remember, but no practical results have ever followed from such. Not only do they introduce many additional mechanical complications, but they set up all kinds of irregular air flows, which not only greatly augment the head resistance but skin friction as well. Moreover we have no real evidence of any such in the world of flying creatures.

**Wing Flexure.**

If the flight of a flapping bird be observed directly from underneath—the movement of the wings appears to be an alternating extension and flexure; being spread out to its full extent one instant and contracted the next. From this it would appear that during the down stroke the wing is spread out to take full advantage of the maximum area of sustentation and flexed or contracted during the up stroke in order to have minimum resistance to upward vertical motion.

Major Baden-Powell constructed a paper cylinder, of a diameter approximately equal to the spread of a certain bird's wing. The interior of the tube was smoked, and the bird being put in at one end, flew through the tube, the tips of his wings scratching off the smoke as he flew. The cylinder was then opened, and a very clear diagram obtained. In another experiment two pieces of smoked paper were hung parallel face to face at a distance apart approxi-



mately that of a certain bird's wing, and the bird allowed to fly between the two smoked sheets.

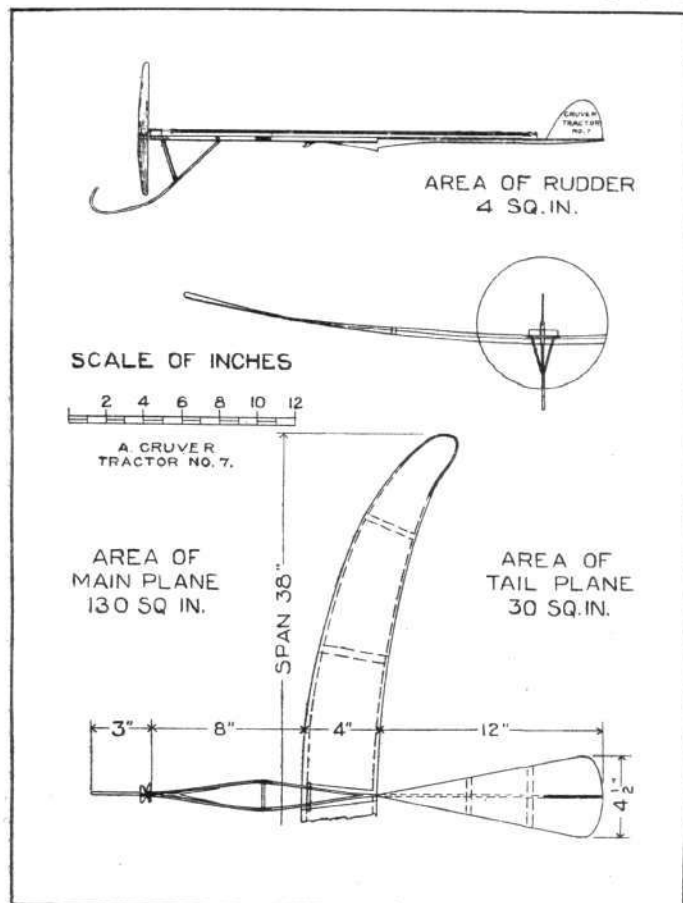
These experiments most conclusively showing that a flapping bird's wing is flexed during the up stroke, as there was scarcely any sign of a scratch during that stroke.

The bird employed was a canary, and the actual marks in the last experiment were such that each wing stroke had rubbed off an imprint somewhat resembling the whole line of an interrogation point. The fully extended wing, at the commencement of the down stroke, first rubbing off a broad curved streak, and then gradually tapering this streak upon a curved line to a point as the wing became flexed, ready for the up stroke.

(To be continued.)

### The Cruver Tractor, No. 7.

Mr. A. Cruver (Chicago, U.S.A.), sends us the accompanying



Mr. Cruver's Model.

illustrations and account of a small tractor, 1.75 ozs. in weight, which will no doubt interest some of our readers.

"This model is the seventh tractor that I have built, and is of quite light weight, viz., 1.75 ozs., including the rubber motor, which

consists simply of two strands of  $\frac{1}{8}$  in. strip and one strand of  $\frac{1}{16}$  in. strip. The fuselage is built of white pine, the two front members being  $\frac{1}{4}$  in. by  $\frac{1}{8}$  in., and the rear,  $\frac{1}{4}$  in. by  $\frac{1}{8}$  in., tapering to  $\frac{1}{8}$  in. by  $\frac{1}{8}$  in. The simple skid is made of hickory,  $\frac{3}{8}$  in. by  $\frac{1}{8}$  in. The model rises quickly from the ground without the use of wheels, doing so in a distance of 5 to 6 ft., and the first flight made under such conditions was 20 secs. The main plane, although light, is not flimsy. The front and rear spars are of willow  $\frac{1}{8}$  in. by  $\frac{1}{8}$  in. and  $\frac{1}{8}$  in. by  $\frac{1}{8}$  in. respectively; both members taper towards the tips. The tips of the wings, which are of hickory  $\frac{1}{8}$  in. by  $\frac{1}{8}$  in., are steamed and bent. The part made from hickory is indicated in the drawing by the heavy line at the extremities of the plane. The ribs are of white holly veneer  $\frac{1}{8}$  in. by  $\frac{1}{8}$  in. The front spar is of streamline section. The tail is made of hickory  $\frac{1}{8}$  in. by  $\frac{1}{8}$  in., and the cross sections are white holly  $\frac{3}{8}$  in. by  $\frac{1}{8}$  in. The rudder is made from No. 12 piano wire. All surfaces are covered with doped chiffon.

"The model's present records are: Distance, 291 yds.; duration, 54 secs. These are the Illinois Model Aero Club tractor records, of which club I am a member.

"The photos., although small, may give you an idea of the model in flight. One is of a model made after the drawings of Mr.

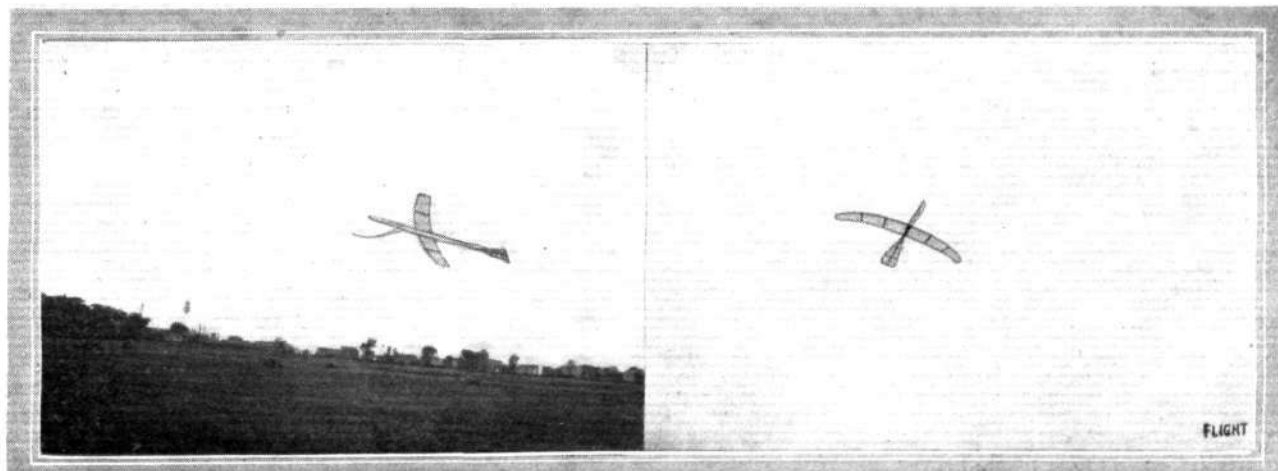


Mr. D. Hiscox's model flying at Hendon, prior to its unfortunate collision with a motor car.

Horner's 2-oz. tractor. I may add that it was my first tractor that really flew."

### Model Scale Drawings which have Appeared in "Flight."

For the convenience of our newer readers, we give the following



Mr. Cruver's model, built from the drawings of Mr. Hornen's 2 oz. tractor, with Mr. Cruver's own launching arrangement. This model made 26 secs. duration and 621 ft. distance, the U.S.A. official records at the time.

list of scale drawings which have appeared in FLIGHT. The list does not claim to be anything more than a fairly complete one from the initial date given:—

December 9th, 1911.—"A" frame, Canard type, weight 7 ozs.  
 December 30th.—Dollittle tractorplane, weight  $4\frac{1}{2}$  ozs.  
 January 27th, 1912.—Long-distance tail type, weight 7 ozs.  
 February 10th.—Nos. 40 and 42 "Clark" monoplane, long-distance Canard, "A" frame type,  $2\frac{1}{2}$  and  $4\frac{1}{2}$  ozs. weight respectively.  
 March 23rd.—Valkyrie-type model.  
 April 6th.—"Trykle" single-propeller model, weight about  $4\frac{1}{2}$  ozs.  
 July 27th.—Model Blériot.  
 September 21st.—"Clark" tractorplane No. 76, weight  $3\frac{1}{2}$  ozs.  
 October 19th.—Tractor biplane, weight 12 ozs.  
 December 14th.—"Horner" biplane  
 December 14th.—American duration model (158 secs.), weight  $5\frac{1}{2}$  ozs.  
 December 28th.—"Howse" tractorplane, weight  $3\frac{1}{2}$  ozs.  
 January 4th, 1913.—Rochet plane model.  
 January 11th.—A paper tractor monoplane.  
 January 11th.—Twin-tractor r.o.g. model, weight 5 ozs.  
 January 25th.—Tractorplane (special device for overcoming torque of motor).  
 February 8th.—A 12-oz. tractor monoplane.  
 May 31st.—Tractor biplanes, staggered planes.

## KITE AND MODEL AEROPLANE ASSOCIATION.

### Official Notices.

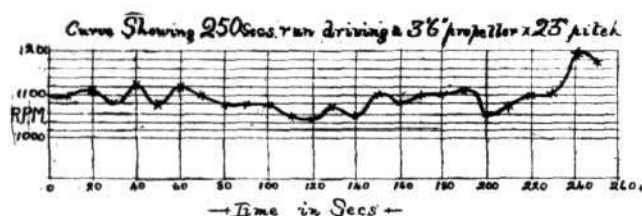
#### British Model Records.

Twin screw, hand-launched	Distance	R. Lucas	590 yards.
Single screw, do. ...	Duration	A. F. Houlberg	129 secs.
Twin screw, rise off ground	Distance	H. Bedford	49 secs.
Single-tractor screw, hand-launched	Distance	L. H. Slatter	365 yards.
Do., off-ground	Duration	J. E. Louch	2 mins. 49 secs.
Single screw hydro., off-water	Distance	C. C. Dutton	266 yards.
Single-tractor, do., do.	Duration	J. E. Louch	68 secs.
Twin screw, do., do.	Distance	C. C. Dutton	190 yards.
	Duration	J. E. Louch	45 secs.
	Duration	L. H. Slatter	35 secs.
	Duration	C. C. Dutton	29 secs.
	Duration	L. H. Slatter	60 secs.

"Model Engineer" Aero Motor Competition.—The results of this competition have been previously reported, and the bench tests of the Bonn-Mayer 2-cyl. V-type engine were as follows:—

Secs.	h.p.	Secs.	h.p.
0	0.98	70	0.62
10	1.11	80	0.62
20	0.81	90	0.66
30	0.66	100	0.62
40	0.45	110	0.66
50	0.505	120	0.60
60	0.70		

1½ in. bore, 2 in. stroke.  
 Benzol used—1 oz. in 2 mins.  
 Weight of engine coils, accumulators, &c., 6 lbs. 3 ozs.  
 Average value of horse-power during 2-min. run, 0.69 h.p.



This run was given to see result with propeller, and is published as it may be of interest to engine makers.

Affiliation.—An application for affiliation has been received from the Croydon and District Aero Club. It is hoped that all clubs will become affiliated before the show so that they can compete for Inter-Club Shield.

Kite Competitions.—The junior kite competition for prizes given by the Aerial League was held on Wimbledon Common on Nov. 1st. The result was: 1st, T. Brown, Croydon, winning the 25s.; 2nd, Irene Akehurst, 15s.; 3rd, C. Francis, Brockley, 10s. The competition for the best use to which a kite could be put was postponed, as the majority could not demonstrate their ideas. The date of the adjourned competition will be on Nov. 29th, on Wimbledon Common.

Research Work.—Volunteers are wanted to undertake this work, and Mr. Cooper of Watford has kindly placed his laboratory at the disposal of the committee, and the work of building a wind tunnel will commence at once, and it is hoped to be able to give some useful data at the general meeting of the association, if not before. Anyone wishing to help should write to the hon. sec. at once.

Aero Show.—The secretaries' guild have drawn up a good list of suggested competitions, and with a few alterations have been passed by the Council (one special clause being that of loading, which was proposed by W. H. Norton on behalf of the Reigate, Redhill and District Aero Clubs). As soon as the joint committees of the Royal Aero Club and the Association have met the details will be published.

Vice-Patron.—On going to Press a letter has been received from His Grace The Duke of Sutherland stating his willingness to become a Vice-Patron of the Association, and thus show his appreciation of its work.

27, Victory Road, Wimbledon.

W. H. AKEHURST, Hon. Sec.

June 14th.—Scale model tractor monoplane.

August 9th.—Tractorplane model.

October 18th.—Tractor model, weight  $19\frac{1}{2}$  ozs.

[Will readers kindly supply any omissions between initial and final dates.—V.E.J.]

### Wanted.

Scale drawings of a successful man-carrying glider.

### Replies in Brief.

J. W. ROBINS.—If you have a spare photo shall be glad to see the same. Thanks for your letter.

B. A. J. PETS.—We have received your note but cannot find any traces of the glider you mention, could you kindly manage to send us another when we will reply to your query.

P. H. Wilkinson, 13, Murray Road, Rugby, desires to know where he can obtain 80 to 100 steel ribs 7 ins. by  $\frac{1}{4}$  in. by  $\frac{1}{2}$  in.

P. W. Peel desires to know the exact weight of a successful glider (without pilot). Perhaps two or three, either clubs or individuals, who happen to be in possession of such, will kindly reply per p.c.

C. Kennard wishes to know if a single thickness of goldbeater's skin is suitable for the envelope of a semi rigid airship 4 ft. 6 ins. long. If not, what other material is suitable? [Apart from the rigidity, which depends very much on the inflation, a single skin is by no means gas-tight; a double or even a triple skin should be used. No other material is suitable, if the model is to be a practical one.—V.E.J.]

## AFFILIATED MODEL CLUBS DIARY.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

**Aero-Models Assoc. (N. Branch) (25, CHURCH CRESCENT, MUSWELL HILL, N.).**

Nov. 8th, practice, 3 p.m. Nov. 9th, practice, 10 a.m. and 3 p.m. Nov. 13th, indoor meeting, 8 o'clock, at "Cabin." Nov. 15th, monthly competition, speed r.o.g., 100 yards course.

**Bristol and West of England Aero Club (Model Section) (42, ROYAL YORK CRESCENT, CLIFTON, BRISTOL).**

MODEL flying on the Downs, near Sea Walls, every Saturday at 3 p.m. (weather permitting) until further notice. For the safety of the public all models flown on the Downs should be fitted with effective protection.

**Leytonstone and District Aero Club (64, LEYSFARM ROAD, LEYTONSTONE, LONDON).**

Nov. 9th, 10 a.m. model flying near Sand Hills. If wet, meet at clubroom.

Nov. 13th, at 8 p.m., instruction at clubroom. Subject, "Hollow spars."

**Paddington and Districts (77, SWINDEBY ROAD, WEMBLEY).**

Nov. 8th, flying at Sudbury, r.o.g. competitions.

**Reigate, Redhill and District (THE COTTAGE, WOODLANDS AVENUE, REDHILL).**

Nov. 8th, flying on Earlswood Common, 3 p.m.

**Sheffield Aero Club (35, PENRHYN ROAD, SHEFFIELD).**

Nov. 15th, general meeting at clubroom, 7.30 p.m. It is essential that every member of the club should be present, some very important business is to be dealt with.

**Wimbledon and District (165, HOLLAND ROAD, W.).**

Nov. 8th and 9th, flying as usual.

## UNAFFILIATED CLUB.

**S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).**

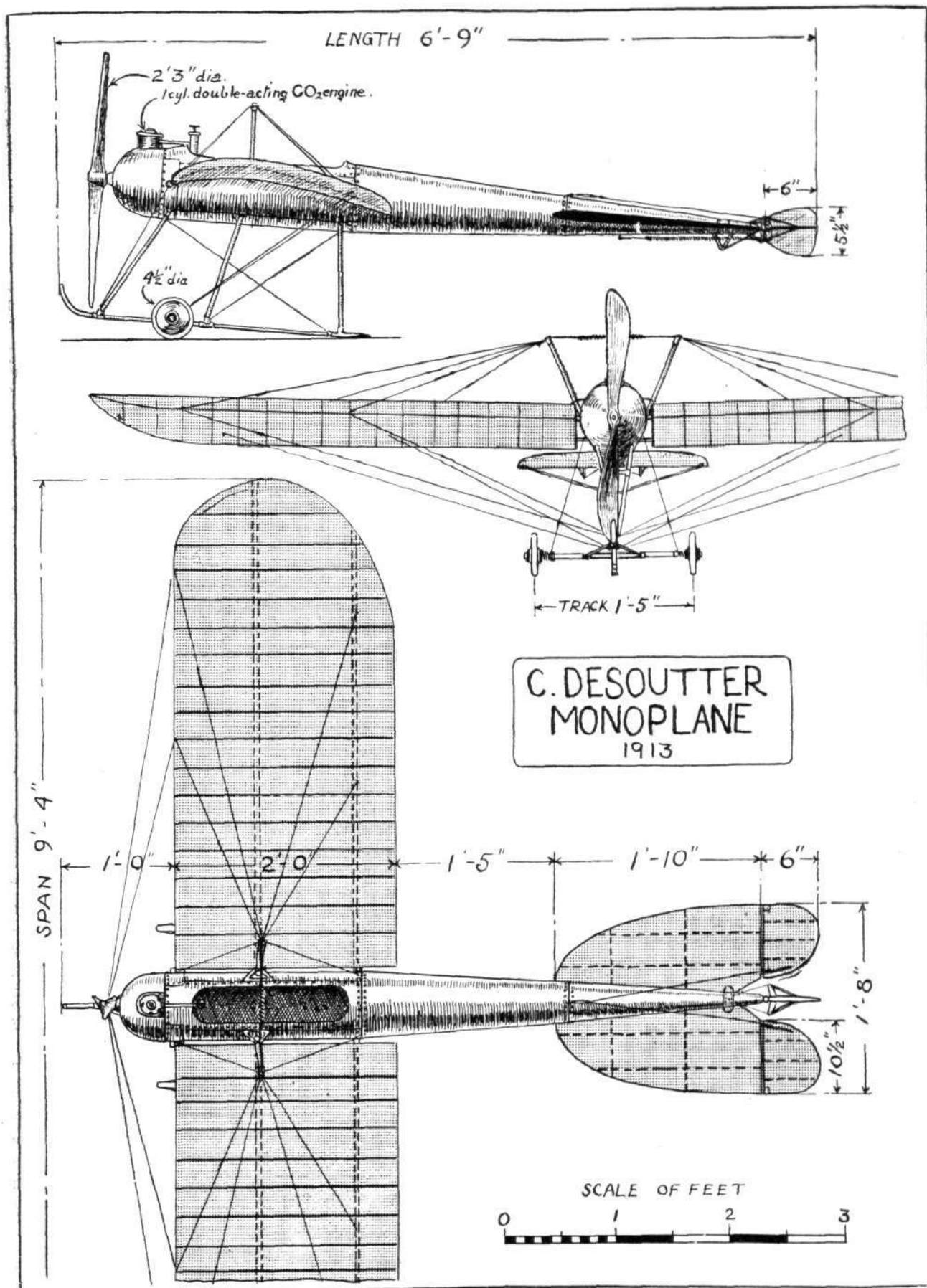
Nov. 8th, Woolwich Common, 3.30 p.m. till dusk. Nov. 9th, Blackheath, 7.30-10 a.m.

## THE DESOUTTER MODEL MONOPLANE.

To be able to construct a successful model aeroplane that closely resembles a full-sized machine is in itself a creditable performance, but when a tractor monoplane has been the type selected for this model it is an achievement to be proud of, for a tractor monoplane is acknowledged to be the most difficult type with which to get successful results. The Desoutter model is not only a faithful representation of a full-sized tractor monoplane, but it possesses some original features, and has made several successful flights, whilst the workmanship is excellent. The most interesting features of this model are the body and landing chassis. The former is of the torpedo pattern, and is built up in three sections of sheet magnesium, each section being easily detached by removing a number of small screws. The chassis is of the Nieuport type, built of steel tubing. The axle consists of three tubes, one within the other, and is attached to the central skid by strong springs. The running wheels are ingeniously mounted on the axle by means of rubber hubs, so that they are extremely resilient. The main planes are of Eiffel No. 8 bis section, built up mostly of yellow pine. The top bracing wires of the main planes are attached to ferrules, which fit on to the two cabane masts, so that the planes are thus easily removed without disturbing the adjustment of the bracing wires. The tail is double surfaced, and is semi-elliptical in shape. The whole model is wonderfully strong, the wing tips and leading and trailing edges of the main planes being reinforced with magnesium sheeting. The power plant is the well-known Desoutter single-cylinder CO<sub>2</sub> power plant.

"VEE JAY."





"Flight" Copyright.

THE DESOUTTER MODEL MONOPLANE.—Plan, side and front elevations to scale.

## CORRESPONDENCE.

### Pegoud's Flying.

[1805] In reading the very interesting description of Pegoud's flight in your issue of October 4th, I note on page 1088 a reference to the loss of height during an evolution such as Pegoud describes.

It is stated that this is at the "rate of about 500 ft. per minute, which is far faster than an express lift as operated in America."

I venture to question the authority for this statement, however. The speed of express elevators in modern American buildings is considerably in excess of this rate. Taking the Singer, Metropolitan, and Woolworth buildings as examples, we find that the car travel in these buildings is at the rate of 600 ft. per minute for the first two and 700 ft. per minute for the third. As in each case, the speed per minute represents the total rise of the car, you will see that a very good simulation of Pegoud's loss of height is experienced when riding in these lifts. All elevators of this type are of the one to one gearless traction type.

The Central Foundry Co., K. G. MARTIN.  
90, West Street, New York City, October 24th.

### The Theory of the Dunne Aeroplane.

[1806] I am very much obliged for Mr. Dunne's explanation of his "reserve tangential." I think the misconception is largely due to the sentence on p. 969, line 12, of FLIGHT for August 30th, "... automatic means of temporarily increasing the speed." Whereas according to his explanation it should be "increasing the horizontal component of the speed," which is not quite the same thing.

This inclining forward of the pressure vector relatively to a line fixed in the wing, as the angle of incidence increases, would, however, seem not unusual in many types of wing sections. From Plate XXVI of M. Eiffel's book I have obtained the angle between the pressure vector and the normal to the chord by subtracting the angle of incidence from the angle between the pressure vector and the normal to the line of flight, and have obtained the following results:—

Angle of incidence	0°	2°	4°	6°	8°	10°	15°
Bird's wing ...	10°	6°	3½°	1½°	—½°	—2°	—5½°
Blériot XI bis ...	13°	3°	0°	—2°	—3°	—3½°	—5½°
Breguet ...	7°	3°	1°	—1°	—2°	—3°	—4°

A positive angle is behind the normal, a negative one in front of the normal. All these wing sections therefore show the "reserve tangential" in a marked degree. The other wing sections given by M. Eiffel do not show it to anything like the same extent, but as seen above in Blériot XI bis and the Breguet, the increase of incidence from 4°, which is about the usual angle in flight, to 15° gives a "reserve tangential" of 5°. The whole matter is, of course, one of great difficulty, but I must confess that I have still some doubt as to this "reserve tangential" being the real cause of the absence of steep diving, when it is also present in these other wing sections.

J. H. HUME-ROTHERY.

### Pegoud's Feats.

[1807] Being an enthusiastic student of aeronautics, I should be glad if you would kindly allow me a little space in your valuable journal to express my appreciation of the views expounded by Mr. Gordon England concerning the above, and particularly those on inherent stability machines.

If Pegoud's feats, less the looping the loop portion, were continued by the most experienced pilots on specially designed machines, I consider the design of future aeroplanes would undoubtedly be somewhat different from those that are in use at present.

It seems quite apparent that the leading feature of any aeroplane must be its capability of rapidly recovering the normal position under all circumstances. To do this, however, it would be necessary for quite 40 per cent. of the main plane area to be under "directional" control, in such a manner that its alignment is variable (both longitudinally and laterally), to produce the necessary applied effort to regain the normal position.

With regard to the difficulty experienced in recovering from sharp spirals or nose dives, would not a "canting" elevator have an advantage over the vertical rudder, inasmuch that it could be applied as retarding, concentrated lifting, or turning effort, in any direction to meet emergencies. Furthermore, when used for steering purposes, it would pitch the requisite bank and turning effort.

If the "canted" elevator could be utilised in the same manner as a bird uses its tail for stability, steering and recovering the normal

position (assisted, of course, by the main planes), another step would be made toward the attainment of safe aviation.

Battersea, S.W.

J. W. ROBINS.

[By a "canting" elevator we presume that Mr. Robins means one that warps laterally and flexes vertically. Such a tail plane has, we believe, been tried on models, and a similar type is fitted on the well-known Caudron machines, in which, however, the vertical rudder has been retained, and the tail plane made to warp in connection with the main planes as well as flexed in a vertical direction for elevation and depression.—ED.]



### The Olympia Motor Car Show.

THERE is such a close connection between motoring and aviation that it is perhaps unnecessary to remind our readers that the Olympia Motor Car Show is now open, and will remain open until Saturday next. Few will miss this opportunity of seeing the latest ideas in the design and construction of motor car engines. A copy of the current issue of the *Auto*, obtainable at any bookstall for one penny, should be secured by everyone, as it deals very fully with the Show, and is copiously illustrated by photographs and sketches.



### NEW COMPANIES REGISTERED.

**Franco-British Aviation Co., Ltd.**—Capital £65,000, in £1 shares. Acquiring the business carried on by M. Henri Leveque at Breyons, France, and of the Société Anonyme des Anciens Chartiers Tellier (Hydroplane de l'Artors), carried on in France as aeroplane constructors.

**Low Petrol Engine Co., Ltd.**, Alderman's House, Bishops-gate, E.C.—Capital £5,000, in £1 shares. Acquiring from A. M. Low, R. Fleming, E. H. Low, J. S. Low, and K. S. Low the benefit of inventions relating to internal-combustion engines.



### PUBLICATION RECEIVED.

*L'Aéronautique Navale Militaire Moderne (France et Etranger).* By Naval Lieut. Charles Lafon. Paris: H. Dunod and E. Pinat, 47-49, Quai des Grands-Augustins. Price 7 fr.



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- 23,830. M. A. BATSON. Flying machines.

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